

HITACHI

Inspire the Next

SERVICE MANUAL

PA

No. 0194

NTSC

DP45
Chassis

51F710	DP45
57F710	DP45
65F710	DP45

R/C: CLU-4341UG2
(HL02071)

This addendum includes all information necessary for the 51F710, 57F710 and 65F710 except information that is the same as the 51S715 and 57S715. Please refer to Service Manual PA No. 0186 when servicing model 51F710, 57F710 and 65F710.

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The electrical and mechanical parts lists parts that are different from Service Manual PA No. 0186.

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CAUTION: These servicing instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by a on the schematics and on the parts list in this Service Data and its supplements and bulletins. Before servicing the chassis, it is important that the service technician read and follow the "Important Safety Instructions" in this Service Manual.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

PROJECTION TELEVISION

SEPTEMBER 2004

HHEA-MANUFACTURING DIVISION

Version 0194.5

ELECTRICAL PARTS DIFFERENCES								
DP47			DP45					
CONVERGENCE			CL10 CL12 CL14 CL16 RL20 RL21 RL23 RL24 RL25 RL26 RL27	0880053R 0880053R 0880053R 0880053R 0100123M 0700066M 0100123M 0100125M 0700065M 0100121M 0100119M	CAP.-POLYESTER 0.047UF-KEB 50V CAP.-POLYESTER 0.047UF-KEB 50V CAP.-POLYESTER 0.047UF-KEB 50V CAP.-POLYESTER 0.047UF-KEB 50V RES.-CARBON FLM 1/8W 270K-JB RES.-CARBON FLM 1/16W 82K-JB RES.-CARBON FLM 1/8W 270K-JB RES.-CARBON FLM 1/8W 330K-JB RES.-CARBON FLM 1/16W 68K-JB RES.-CARBON FLM 1/8W 220K-JB RES.-CARBON FLM 1/8W 180K-JB	CL10 CL12 CL14 CL16 RL20 RL21 RL23 RL24 RL25 RL26 RL27	0880048R 0880048R 0880048R 0880048R 0100125M 0700064M 0100127M 0100129M 0700066M 0100125M 0100123M	CAP.-POLYESTER 0.022UF-KEB 50V CAP.-POLYESTER 0.022UF-KEB 50V CAP.-POLYESTER 0.022UF-KEB 50V CAP.-POLYESTER 0.022UF-KEB 50V RES.-CARBON FLM 1/8W 330K-JB RES.-CARBON FILM 1/16W 56K-JB RES.-CARBON FILM 1/8W 390K-JB RES.-CARBON FILM 1/8W 470K-JB RES.-CARBON FILM 1/16W 82K-JB RES.-CARBON FLM 1/8W 330K-JB RES.-CARBON FLM 1/8W 270K-JB
CONTROL			DM17 NOT APPLIED KM44 RM68 NOT APPLIED NOT APPLIED SM08	CH02711 2974432M AT03872M FE10402R	SLR343 BBT3F (LED BLUE) JUMPER WIRE (0.5 L=52MM) RES.-1.2KOHM 1/2W RDS50 CARBON FILM PUSH SWITCH SKQNAB	NOT APPLIED DM22 NOT APPLIED NOT APPLIED RM74 SM01 NOT APPLIED	CH02671 AT03866M FE10402R	LED SR3517F6 (RED) RES.-470OHM 1/2W RDS50 CARBON FILM PUSH SWITCH SKQNAB
DEFLECTION			RH27 RH32	0100098M 0100119M	RES.-CARBON FLM 1/8W 24K-JB RES.-CARBON FLM 1/8W 180K-JB	RH27 RH32	0100100M 0100121M	RES.-CARBON FLM 1/8W 30K-JB RES.-CARBON FLM 1/8W 220K-JB
SIGNAL			CA53 CA54 NOT APPLIED PSP RA23 RA24 U901	0258616 0258616 ED00387 AQ00196R AQ00196R HA01311	CAP.-ELECTRO 2.2UF-M 50V CAP.-ELECTRO 2.2UF-M 50V PLUG 8P LOCK 2.5MM JST RES.CHIP 1/16W 1.2K OHM TAPE RES.CHIP 1/16W 1.2K OHM TAPE MAIN POWER SUPPLY	NOT APPLIED NOT APPLIED D021 PSP RA23 RA24 U901	2344041M ED00385 AQ00203R AQ00203R HA01312	DIODE 1SS254TA/1SS270TA PLUG 6P LOCK 2.5MM JST RES.CHIP 1/16W 2.2K OHM TAPE RES.CHIP 1/16W 2.2K OHM TAPE MAIN POWER SUPPLY
FINAL			U401 U402 U403 U404 UPFK	GK00911 GK01291 GK00911 GK01291 AZ00165	SPEAKER SP-5CM C057FT511-10 SP-13CM C130RB503-10 SPEAKER SP-5CM C057FT511-10 SP-13CM C130RB503-10 FOCUS PACK	NOT APPLIED U402 U402 NOT APPLIED U404 U404 UPFK UPFK	GK01301(51") GK01311(57"/65") GK01301 GK01311(57"/65") AZ00724(51") AZ00165(57"/65")	SP-12CM C120RB514-10 SP-16CM C160RB506-10 SP-12CM C120RB514-10 SP-16CM C160RB506-10 FOCUS PACK FOCUS PACK

SERVICE ADJUSTMENTS

TO GO TO AN ADJUSTMENT, CLICK ON ITS HEADING BELOW

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*IMPORTANT

For many of the above adjustments, it is necessary to have an HDTV (1080i or 720P) signal generator, SDTV (480P) signal generator, as well as the usual NTSC (480i) signal generator.

Hitachi recognizes that few companies offer HDTV or SDTV signal generators and that the cost of these generators is sometimes prohibitive. For this reason, we suggest the use of a set-top-box for HDTV and SDTV adjustments. Usually, there is a switch on the set-top-box which enables it to output HDTV (1080i or 720P) or SDTV (480P) signals even with no input. In this case, the sync is automatically detected by the TV (at the Y-P_BP_R Inputs on the rear panel).

1. ASSEMBLED P.W.B. ADJUSTMENT

1.1 Service Menu Access

Adjustment Procedure

(1) Press and hold INPUT key on Control Panel and then press POWER key on control panel to access I²C adjustment mode.

(2) Receive signal on main picture. (NTSC, SDTV or HDTV).

Some menu pages have I²C adjustments for SDTV and HDTV. The set will automatically allow you to set these items only when a SDTV or HDTV signal is input to the COMPONENT jacks on the back of the TV.

See table below.

(3) Check the OSD according to table on the following pages, using CURSOR ▲, ▼ on Remote Control.

*: Adjustable Data

Others: Fixed Data (be careful not to change)

(4) Press EXIT key to exit I²C ADJUST mode.

NOTES: (1) If the TV I²C data is different from the I²C Parameter (of the following pages) for fixed data, change the data.

(2) When exchanging microprocessor or EEPROM and TV is turned on for first time, it requires initialization of Memory Initial of I²C adjustment menu. Press CURSOR ► and hold for 3 seconds to initialize memory.

(3) Use FACTORY RESET to set TV to out of factory shipping conditions: Do not use MEMORY INITIALIZE.

IMPORTANT: IN CASES AFTER THE SERVICE PERSON PERFORMS A FACTORY RESET OR MEMORY INITIALIZE, **YOU MUST UPLUG TV AND PLUG BACK IN.**

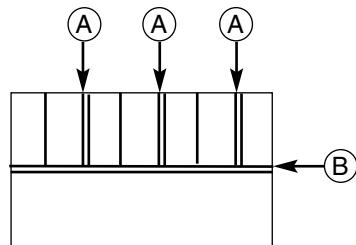
1.2 Comb filter operation check

Adjustment preparation

- (1) Receive the color bar signal at the regular tuning point.
- (2) Set the CONTRAST control to MAX and the other controls to center.

Adjustment procedure

- (1) Check line dots condition at border of each color A, B as follows.



Check (A) and (B) line dots.

3D Y/C
Dots
(A) None
(B) None

1.3 Video Settings (Advanced Settings) Check

1.3.1 Color Temperature Control Check

Adjustment preparation

- (1) Receive the white raster signal.
- (2) Set the video controls to normal conditions.

Adjustment procedure

- (1) Select the Video mode using the **▲▼** buttons and press Select button.
- (2) Select Color Temperature option using the **▲▼** buttons and press Select button.
- (3) Select MEDIUM using **◀▶** buttons and Picture will turn reddish slightly.
- (4) Select STANDARD using **◀▶** buttons and Picture will turn more reddish.
- (5) Select Black & White using **◀▶** buttons and Picture will turn more and more reddish.
- (6) Select HIGH using **◀▶** buttons and Picture will turn bluish.



Important: High Voltage adjustment should NOT be adjusted in field. This is adjusted at factory using precise loads and should NOT be readjusted.

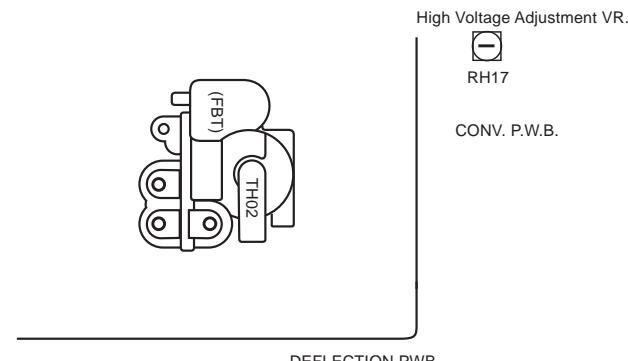
1.4 High Voltage Adjustment (should NOT be readjusted in field).

Adjustment preparation

- (1) Connect High Voltage meter to FBT High Voltage output. Connect GND of High Voltage meter to CPT GND or FBT GND.
- (2) Check that High Voltage adjustment VR (RH17) is set to mechanical center. (located behind FBT on DEFLECTION PWB).
- (3) Receive circle pattern signal.
- (4) VIDEO control should be reset.

Adjustment procedure

- (1) Adjust High Voltage to following spec. by turning VR RH17 slowly. ADJ. SPEC = 31.7KV±0.2kV.
- (2) After adjustment, fix VR RH17 with Silicone glue (KE40RTV).



2. FINAL ASSEMBLY ADJUSTMENT

2.1 Cut Off Adjustment

Adjustment Preparation:

1. Allow 20 minutes pre-heat run.
2. Set video conditions to factory presets.

Adjustment Procedure:

1. Access the I2C Adjustment Mode
- 1.1 On the front panel, press and hold the INPUT button, then press the POWER button; release both after hearing HV startup.
2. Select SERVICE from adjustment menu by pressing the **▶** button on the remote. This will collapse the vertical deflection.
3. Turn all screen (G2) controls to the full counter-clockwise position.

4. Bring up each screen G2 control, one at a time, until that color is just barely visible. (Also, adjust the focus control for each color to obtain optimum focus.)
5. After all colors are finished, press the **◀** button on the remote to un-collapse the vertical, and return to normal.

NOTE: Never power off the TV while in the Service position of the I2C Adjustment Mode (vertical collapsed) as CRT damage may result.

2.2 DCU Phase Data Setting

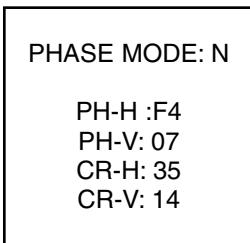
Adjustment preparation

- (1) Cut off adjustment should be finished.
- (2) Set video conditions to factory preset.
- (3) R/C must be in DCAM mode (see page 47).

Adjustment procedure

- (1) Receive any NTSC signal.
- (2) Push "SERVICE ONLY" SW on DEF./CONV. PWB. (Enter to DCU ADJ. mode).
- (3) Press [C.C] key on R/C. (Green cross hatch is displayed).
Then push EXIT key on R/C. (Character pattern is displayed. This is the PHASE setting mode).
- (4) Set PH-H phase data as shown below by using [4] and [6] key on R/C.
- (5) Set PH-V phase data as shown below by using [2] and [5] key on R/C.
- (6) Set CR-H phase data as shown below by using CURSOR PAD **◀** and **▶** key on R/C.
- (7) Set CR-V phase data as shown below by using CURSOR PAD **▲** and **▼** key on R/C.
- (8) Push [EXIT] then [C.C] (key on R/C to exit from the PHASE mode).
- (9) Press ASPECT key 2 times on R/C to write the phase data to memory.
- (10) When Green dots are displayed, push [MUTE] key to return to DCU ADJ. mode.
- (11) Push "SERVICE ONLY" SW to return to RF or VIDEO mode.

Normal Mode



2.3 Horizontal Position Adjustment (Coarse)

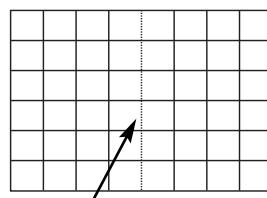
Adjustment preparation

- (1) DCU PHASE DATA SETTING should be finished.

Adjustment procedure

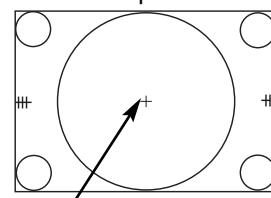
- (1) Receive circle pattern.
- (2) Push SERVICE ONLY switch to display DCU crosshatch. Mark the DCU crosshatch center position using your finger tip.
- (3) Push SERVICE ONLY switch again to exit from the DCU crosshatch.
- (4) Go to I²C ADJ. mode.
- (5) Choose H. POSI item by using up/down cursor key. Adjust horizontal position to match the circle center to DCU crosshatch center (marked by your finger tip).
- (6) Exit from I²C menu.

DCU crosshatch



DCU crosshatch center

ATSC or NTSC
Circle pattern



Circle center

Remark The "SERVICE ONLY" switch located on the DEF./CONV. PWB.

1080i 16:9 STANDARD

- (7) Receive any 1080i Signal (fH=33.75KHz) circle pattern signal (Input to component video terminal).
- (8) Repeat steps (2)~(5).
- (9) Press SELECT key, then H. POS H will appear. It means HD mode is activated.
- (10) Exit from I²C menu.

2.4 Raster Tilt adjustment (Deflection yoke)

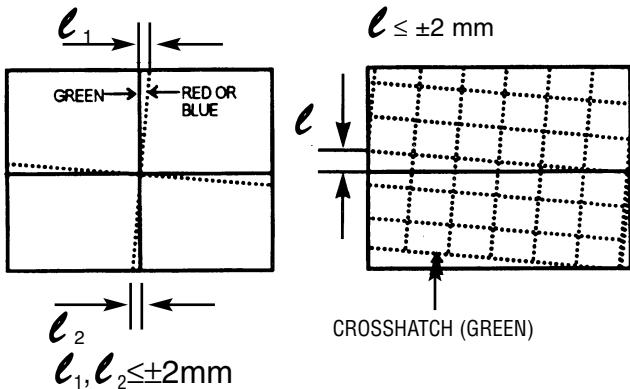
Adjustment preparation

- (1) The set can face east or west.
- (2) Input the single cross test signal.
- (3) Set CONTRAST to MAX, other controls to CENTER.
- (4) The lens focus and horizontal position adjustment should have been coarse adjusted.
- (5) The electrical focus should have been coarse adjusted.
- (6) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the "SERVICE ONLY" switch and then press the power button.
- (7) Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure

- (1) Short-circuit 2p EH (TS) sub-mini connectors on Red and Blue CPT P.W.B.s to project only the Green beam.
- (2) Turn the G deflection yoke and adjust the vertical raster inclination.
- (3) Then, remove the shorted wire on the 2p EH(TS) sub-mini connectors on the R or B CPT PWB and project red or blue light and green light together on screen.

(4) Turn the deflection yoke of R or B and set so that the inclination of R or B light with respect to the green light is as shown below on the top and bottom sides.
 (5) After raster inclination adjustment, the DY screw should be screwed to 10-14kg-cm torque.



Notes: (1) If internal cross-hatch does not appear after clearing RAM data, press service switch again, on DEF./CONV. PWB.
 (2) To restore old RAM data, turn TV off and on.

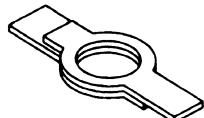
2.5 Beam alignment

Adjustment preparation

- (1) Adjust at least 30 minutes after turning on power switch.
- (2) Raster tilt should be completed. Raster position, horizontal and vertical size, and optical focus adjustment should be coarse adjusted.
- (3) Set video conditions to factory preset.
- (4) Receive cross-hatch signal.

Adjustment procedure

- (1) Green (G) tube beam alignment adjustment. Short-circuit TS (2p EH) subminiature connector plug pins of Red (R) and Blue (B) on the CPT boards and project only Green (G) light or you may cover the R and B lens.
- (2) Put Green (G) tube beam alignment magnet to the cancel state as shown below.



- (3) Turn the Green (G) electrical focus (Focus Pack) counterclockwise all the way and make sure of position of cross-hatch center on screen. (Halo state.)
- (4) Turn the Green (G) electrical focus (Focus Pack) clockwise all the way. (Blooming state.)
- (5) Turn two magnets forming alignment magnet in any desired direction and move cross-hatch center to position found in (3).
- (6) If image position does not shift when Green (G) static focus (Focus Pack) is turned. Green (G) beam alignment has been completed.
- (7) If image position shifts when Green (G) static focus (Focus Pack) is turned, repeat (2)-(6).
- (8) Conduct beam alignment for red (R) and Blue (B) focus: Focus Pack UFPK.
- (9) Upon completion of adjustment, fix beam alignment magnets with white paint.

2.6 Raster position adjustment

Adjustment preparation

- (1) The set can face east or west.
- (2) Input the single cross test signal.
- (3) Set video conditions to factory preset.
- (4) The electrical focus should have been coarse adjusted.
- (5) The digital convergence RAM should be cleared (uncorrected state). With the TV set off, press and hold the service switch located on the DEF./CONV. PWB and then press the power button.
- (6) Start adjustment 20 minutes or more after TV is turned on.

Adjustment procedure

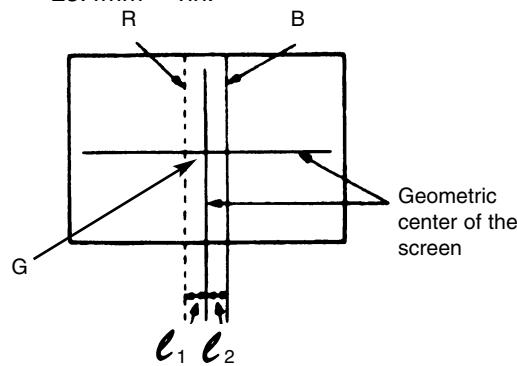
- (1) Turn the centering magnets for red, green, and blue to satisfy the condition below. The red and blue horizontal lines should match with green.

	ℓ_1 (RED)	ℓ_2 (BLUE)
51", 57", 65"	20	25

Tolerance: $\pm 2\text{mm}$

Units = millimeters

25.4mm = 1in.



- (2) Upon completion of adjustment, fix centering magnets with white paint.

NOTES: (1) If internal cross-hatch does not appear after clearing RAM data, press service switch again.
 (2) To restore old RAM data, turn TV off and on.

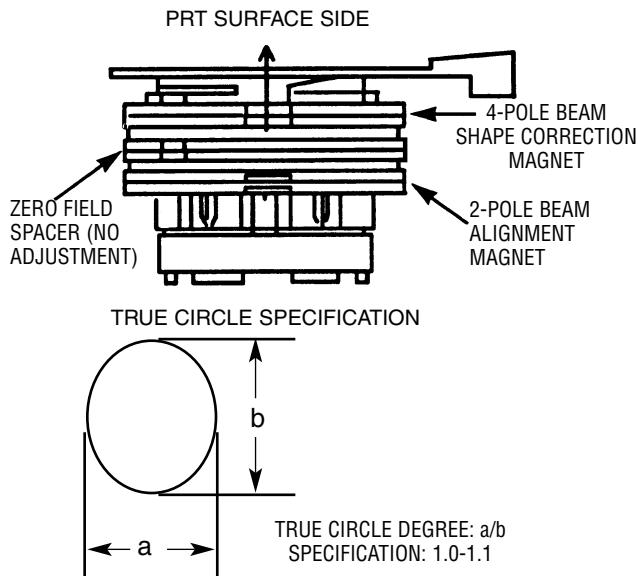
2.7 Beam form adjustment

Adjustment preparation

- (1) Raster Position should have been completed.
- (2) The raster tilt and centering should have been completed.
- (3) Set video conditions to factory preset.
- (4) Input the dot signal.
- (5) Set Aspect to 4:3 Standard Mode.

Adjustment procedure

- (1) Green PRT beam shape adjustment. Short-circuit TS (2p EH) sub-mini connectors on Red and Blue CPT P.W.B.s to project only the Green beam.
- (2) Turn the green static focus VR, on the Focus Pack, fully clockwise. (Blooming)
- (3) Make the dot at the screen center a true circle using the 4-pole magnet as shown below.
- (4) Also adjust the Red and Blue PRT beam shapes according to the steps (1) to (3).
- (5) After the adjustment has been completed, return R, G and B static VRs to the just focus point.
- (6) After the BEAM FORM is completed, fix the BEAM FORM magnet with white paint.



2.8 SIDE PIN DISTORTION & VERTICAL SIZE & HORIZONTAL SIZE & TRAPEZOID DISTORTION ADJUSTMENT

Adjustment preparation

- (1) Receive any NTSC signal.
- (2) VIDEO control should be set Factory Preset condition.
- (3) BEAM FORM adjustment should be finished.

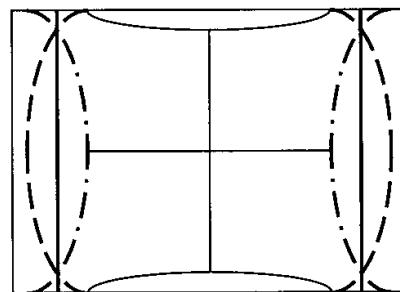
Adjustment procedure

NORMAL MODE

- (1) With the unit on, and the R/C in DCAM mode.
- (2) Press the service button and press the [MUTE] key on R/C at the same time. Uncorrected crosshatch is displayed.
- (3) Press and hold the [MENU] key on the front panel for 3 seconds, then I²C menu is displayed.

SIDE PIN DISTORTION

- (3) Choose "EW PARA" (SIDE PIN) item by using [MENU] key and ▼ key.
- (4) Adjust SIDE PIN as follows using ▲, ▾ keys.



Left and right side edge of vertical DCU cross-hatch line should be straight condition.

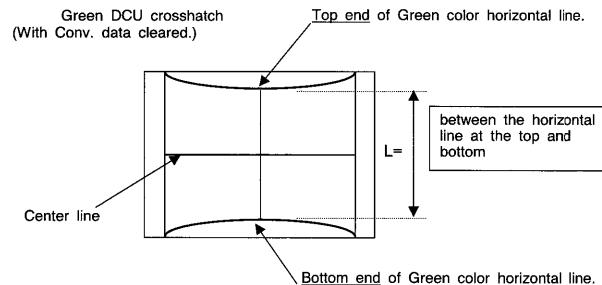
NOTE: If it's impossible to adjust the straight line, set a little pin condition.

VERTICAL SIZE

- (5) Choose "V SIZE" item by using ▲, ▾ keys.
- (6) Adjust V SIZE as follows using ▲, ▾ keys.

	V. Size Specification
51"	560
57"	625
65"	710

Tolerance: ± 5mm
Units = mm



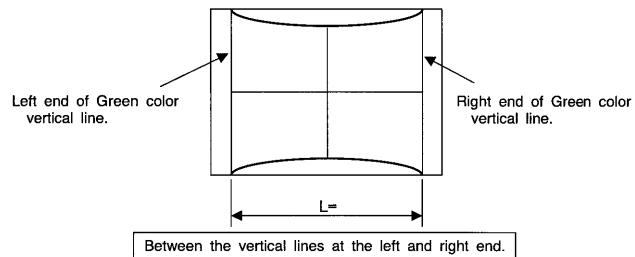
HORIZONTAL SIZE

- (3) Choose "H SIZE" item by using ▲, ▾ keys

	H. Size Specification
51"	1070
57"	1195
65"	1365

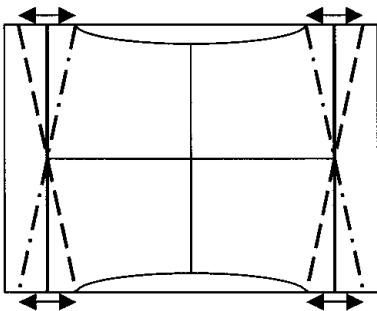
Tolerance: ± 5mm
Units = mm

Green DCU crosshatch (with conv. Data is clear)



TRAPEZOID DISTORTION

- (9) Choose “EW TRAP” (TRAPEZOID) item by using ▲, ▼ keys.
- (10) Adjust TRAPEZOID as follows using ◀, ▶ keys.
- (11) After adjustment, press [EXIT] key on R/C and SERVICE ONLY SW to exit from DCU Crosshatch.



Vertical Screen frame line & edge of vertical DCU cross-hatch line should be Parallel condition.

2.9 LENS FOCUS ADJUSTMENT

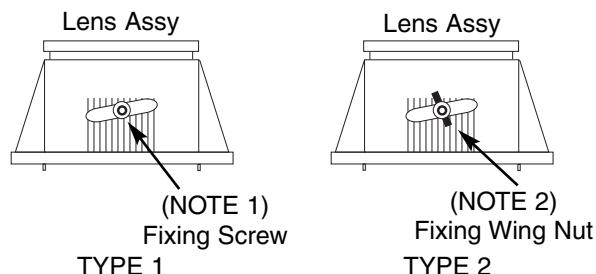
Adjustment preparation

- (1) The orientation of PTV set is arbitrary, west, east, north and south.
- (2) Centering DY inclination should have been adjusted.
- (3) Static focus adjustment should have been coarse adjusted.
- (4) Drive VR location adjustment should have been completed. (Red : 12 O'clock, Green : 1~2 O'clock).
- (5) Receive the cross-hatch pattern signal.
- (6) Refer to setup below.
CONTRAST : HALF of full scale.
BRIGHTNESS : minimum

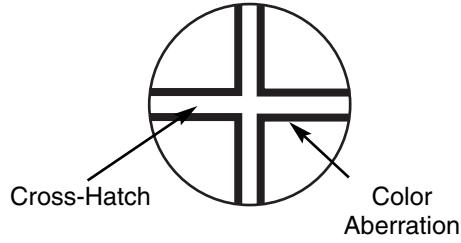
Adjustment procedure

- (1) Loosen the fixing screw or wing nut on the lens cylinder so that the lens cylinder can be turned. (Be careful not to loosen too much). After completing steps (4), (5), (6) below, tighten the fixing screws or wing nuts for each lens with a torque of 1.18N.m (12Kgf cm) ~ 1.67N.m (17Kgf cm).

(Be careful the lens cylinder does not turn after having tightened the screw or wing nuts. If it is tightened too much, lens may tilt or screw may break.)

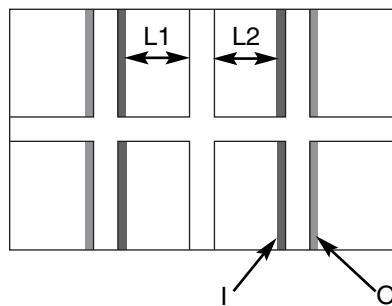


- (2) Apply covers to each color of R, G and B lenses. And project a single color on the screen and adjust in sequence. (The adjustment order of G, R and B is only an example.)
- (3) If the lens adjustment knob is turned clockwise viewed from the front, the color Aberration change as follows.



	Change of Color Aberration	
	Short focus	Long focus
RED LENS	Orange	Scarlet
GREEN LENS	Blue	Red
BLUE LENS	Purple	Green

- (4) In case of G lens. Set to the point where the chromatic aberration switches from blue to red. If the chromatic aberration appearing all over the screen is not the same, observe the vertical bright line and adjust lens focus as specified in table below. When the red chromatic aberration appearing at both sides of the bright line is not equal, observe the side with larger chromatic aberration when adjusting.

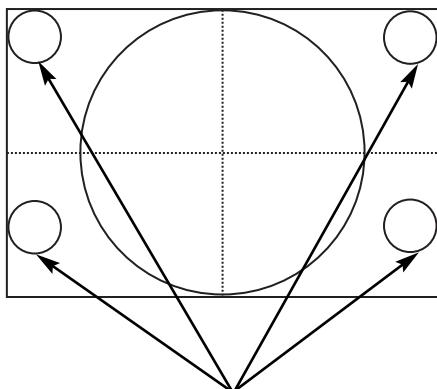


OPTICAL FOCUSING ADJUSTMENT GREEN

CHASSIS		DP45		
SCREEN SIZE		51"	57"	65"
L1 and L2 (PITCHES from CENTER)		1.0	1.0	3.0
COLOR ABERRATION	BETWEEN L1&L2	*	*	*
	I	*	*	*
	O	2.0mm MAX	3.0mm MAX	3.5mm MAX

(NOTE) * Slightly reddish or no color
** Slightly bluish or no color

Change the signal to the circle pattern and fine adjust. Observe the corner part of the screen, especially observe number in the small circle when adjusting. If the focus performance at the screen center exceeds the lower limit, it is acceptable.

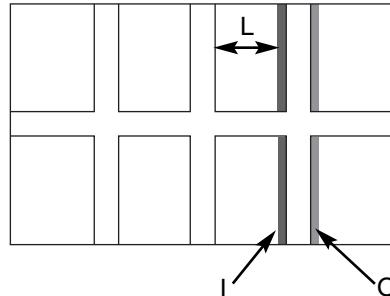


Small circle of circle pattern

NOTES:

1. Since the G light is very important for picture quality and performance, pay special attention in its adjustment.
2. Be careful not to touch the lens with your fingers when adjusting.

(5) In case of R lens. Set the position where the chromatic aberration changes from red to crimson. As shown below, observe the vertical bright line and adjust lens focus where the crimson or red chromatic aberration slightly appears inside, and crimson or red outside (reference value : 1~3mm) at the point specified in table below. Change the signal and fine-adjust the same way as the G lens.



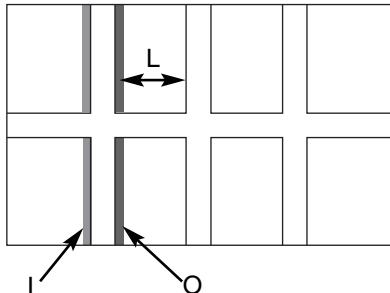
NOTE: Setting the center between Red and crimson is optimum.

OPTICAL FOCUSING ADJUSTMENT RED

CHASSIS		DP45		
SCREEN SIZE		51"	57"	65"
L1 and L2 (PITCHES from CENTER)		3.0	3.0	3.0
COLOR ABERRATION	BETWEEN L1&L2	*	*	*
	I	*	*	*
	O	2.0mm MAX	3.0mm MAX	3.5mm MAX

(NOTE) * Slightly reddish or no color
** Slightly crimson or no color

(6) In case of B lens. Set the position where the chromatic aberration changes from purple to green. As shown below, observe the vertical bright line and adjust lens focus where the purple or green chromatic aberration slightly appears inside and purple or green outside (reference value : 1~3mm) at the point specified in table below. Change the signal and fine-adjust in the same way as the G lens.



NOTE: Setting to the center between purple and crimson is optimum.

OPTICAL FOCUSING ADJUSTMENT BLUE

CHASSIS		DP45		
SCREEN SIZE		51"	57"	65"
L1 and L2 (PITCHES from CENTER)		3.0	3.0	3.0
COLOR ABERRATION	BETWEEN L1&L2	*	*	*
	I	*	*	*
	I	2.0mm MAX	3.0mm MAX	3.5mm MAX
	O	2.0mm MAX	3.0mm MAX	3.5mm MAX

(NOTE) * Slightly reddish or no color

** Slightly greenish or no color

- (7) After all colors have been adjusted, display all colors with the cross-hatch pattern signal and check the focus performance.
- (8) Then, select the circle pattern signal and check the focus performance of each color and all colors together.
- (9) If the focus performance is not acceptable re-adjust step (1) to (6).

2.10 STATIC FOCUS ADJUSTMENT

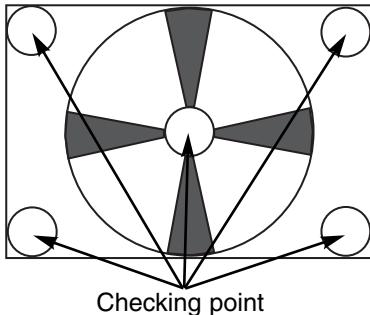
Adjustment preparation

- (1) LENS FOCUS adjustment should be finished.
- (2) Contrast : MAX
Brightness : Center.
- (3) Receive the 480i/480p circle pattern signal & 1080i circle pattern.
- (4) Apply covers to the lens of the colors you are not adjusting and project only one color on the screen.

Adjustment procedure

- (1) Red and blue static focus adjustment. Adjust the static focus VR on Focus pack (UFPK) so that the center of circle pattern is the most clear. Check that the focus does not get conspicuously worse at the edges of the circle pattern signal or cross-hatch signal.
- (2) Green static focus adjustment. Adjust the static focus VR on Focus pack (UFPK) (for green) so that the center of circle pattern is the most clear. Check that the focus does not get conspicuously worse at the checking point, the periphery of circle pattern cross-hatch signal.

NOTE: Checking point for the periphery of picture.



2.11 Digital convergence adjustment

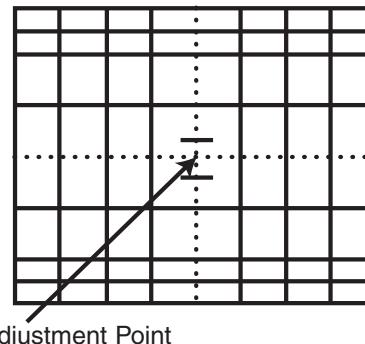
Note: 1. If replacing a PRT, DY, etc. perform auto-digital convergence first. (Press front panel MAGIC FOCUS switch). This can eliminate the need for a complete digital convergence alignment.

2. To enter digital convergence adjustment mode without removing the front speaker grill, please do the following:

- 1) Press "Magic Focus" button on the front panel.
- 2) While "Magic Focus" is running, press Magic Focus button again to "Stop".
- 3) Press INFO button after "STOP" OSD appears on the screen to enter digital convergence mode.
- 4) Proceed with convergence adjustment and save the data.
- 5) Do MAGIC FOCUS sensor initialization.
- 6) To exit, press POWER button on the front panel.

Adjustment preparation

- (1) Receive an RF or video signal.
- (2) Set controls to factory preset.
- (3) Install jig screen on the set.
- (4) Note the center of the video pattern displayed. This is necessary to match dotted lines (adjustment point viewed) and actual point that is adjusted and displayed by the video signal.
- (5) Press the service only switch (on DEF/CONV. PWB). The pattern displayed is now the digital convergence mode.
- (6) When performing a complete digital convergence adjustment CLEAR DATA in RAM. (With the TV set off, press and hold the service switch located on the DEF/CONV. P.W.B. and then press the POWER button).



2.11.1 MAGIC FOCUS Character Set-Up

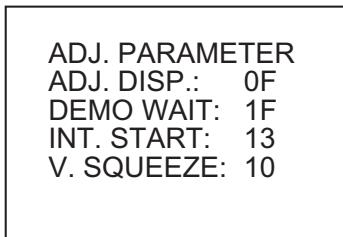
This instruction should be applied when a new DCU is being replaced.

Adjustment Preparation

- (1) Receive NTSC RF or video signal.
- (2) With Power off, PRESS and HOLD the SERVICE ONLY button on DEF/CONV. PWB, then press the Power On/Off, when picture appears release SERVICE ONLY switch (Internal crosshatch is displayed without conv. correction data).
- (3) Set R/C to DCAM mode (refer to page 47).
- (4) Press the DAY/NIGHT button 2 times for ROM READ operation. Picture will appear with convergence correction data.

Adjustment Procedure

- (1) Press key on R/C. (One additional line appears near the top and near the bottom.)
- (2) Press key, then ADJ. PARAMETER mode is displayed as following.



- (3) Press CURSOR PAD or to change the ADJ. DISP. data.
- (4) Press CURSOR PAD to access DCU parameter. Change the data as shown on Table 1, DCU Parameter.
- (5) Press Aspect key 2 times to write changed data into EEPROM. (First press ADJ. PARAMETER/ROM WRITE? is displayed for alarm. 2nd press, writes data into EEPROM. Green dots appear after completion of operation.)
- (6) Press MUTE/VOLUME key 3 times to exit from ADJ. PARAMETER mode.

TABLE 1. - DCU PARAMETER

Parameter	Normal
ADJ. DISP	0F
DEMO WAIT	1F
INT. START	13
V. SQUEEZE	10
INT STEP 1	02
INT STEP 2	06
INT BAR	2D
INT DELAY	01
MGF STEP 1	50
MGF STEP 2	06
MGF BAR	1B
MGF DELAY	01
SEL. STAT.	00
LINE WID	7F
ADD LINE	09
SENSOR CK	00
PORT 0	07
PORT 1	06
PORT 2	05
PORT 3	04
PORT 4	03
PORT 5	02
PORT 6	01
PORT 7	00
AD LEVEL	03
CENT. BAL	01
E. DISPLAY	00
ADJ. TIMS	60
AD LEVEL	05
AD NOISE	0A
OVER. LF-H	01
OVER. LF-V	00
OVER. RI-H	00
OVER. RI-V	00
PHASE MOT	60
H. BLK-RV	0A
H. BLK-GV	03
H. BLK-BV	09
H. BLK-H	20
PON DELAY	0F
IR-CODE	00
INITIAL 50	9E
MGF 50	96
CENTER 50	FE
STAT 50	FE
DYNA 50	9F

2.11.2 MAGIC FOCUS Pattern Set-Up

NOTE:

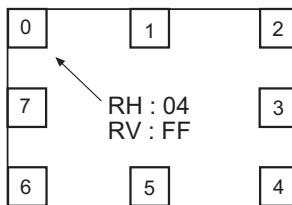
- (1) This instruction should be applied when a new DCU is being replaced.
- (2) This instruction shows how to set up the pattern position for MAGIC FOCUS.

Adjustment Procedure

- (1) Receive NTSC RF or video signal.
- (2) With Power off, PRESS and HOLD the SERVICE ONLY button on DEF./CONV. PWB, then press the Power On/Off, when picture appears release SERVICE ONLY button (Internal crosshatch is displayed without conv. correction data).
- (3) Set R/C to DCAM mode (refer to page 47).

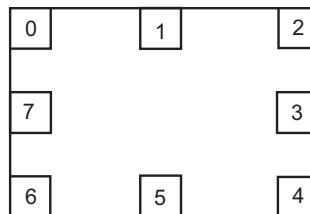
Adjustment Procedure

- (1) Press  key on R/C. (One additional line appears near the top and near the bottom.)
- (2) Press C.C. key, then MAGIC FOCUS PATTERN mode is displayed as follows:



- (3) Use [6] key on remote control to rotate the arrow. Arrow indicates each sensor position. (Upper left corner, middle top, upper right corner, right middle, in this order).
- (4) Use the keys to switch color of pattern.
INFO : Green pattern
0 : Red pattern
INPUTS : Blue pattern
- (5) Press CURSOR PAD  or  to change the data value to the horizontal direction. Press CURSOR PAD  or  to change the data value to the vertical direction.
- (6) Set the data as shown below:

Pattern Position



Pattern: 51" & 57" (Sensor: 20mm)
Normal Mode

	0	1	2	3	4	5	6	7
RH	04	00	fc	02	fc	00	04	fe
RV	ff	fe	01	00	fe	01	00	00
GH	04	00	fc	02	fc	00	04	fe
GV	ff	fe	ff	00	ff	01	00	00
BH	04	00	fc	02	fc	00	04	fe
BV	ff	fe	ff	00	00	01	ff	00

Pattern: 65"
Normal Mode

	0	1	2	3	4	5	6	7
RH	08	02	f6	fe	f6	02	08	00
RV	04	02	06	00	fb	ff	fe	00
GH	08	00	f8	00	f8	00	08	00
GV	03	01	04	00	fc	ff	fe	00
BH	08	fe	f8	fe	f8	fe	08	00
BV	05	01	02	00	fd	ff	fc	00

- (7) Press ASPECT key 2 times to write the changed data in EEPROM. (First press, ROM WRITE ? 2nd press, writes data into EEPROM. Green dots appear after completion of operation.)
- (8) Push POWER key (on control panel) to exit from PATTERN mode.

“Convergence For Outside Signal” function

a) Press Service Switch on DEF/Conv PWB, then display "Normal Crosshatch". (Fig. 1)



b) Press [MENU] key on R/C, then display "Red + Green Crosshatch with Red Marker" or "Green Crosshatch with Green Marker" or "Blue + Green Crosshatch with Blue Marker". (Fig. 2)



c) Press [MENU] key on R/C again, then display "Normal Crosshatch on Main Picture" (Fig. 3)



d) Press [MENU] key on R/C again, then display "Cross Marker + Box Marker on Main Picture". (Fig. 4)



e) Press [MENU] key on R/C again, then display "only Box Marker on Main Picture". (Fig. 5)



f) Press [MENU] key on R/C again, then display "Normal Crosshatch" again. (Fig. 1)

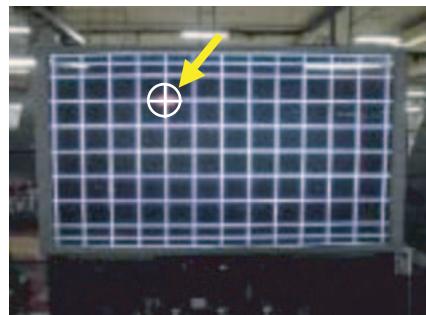


Fig. 1

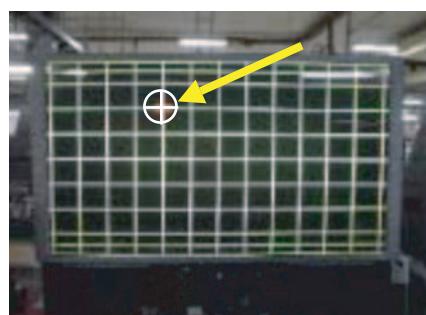


Fig. 2

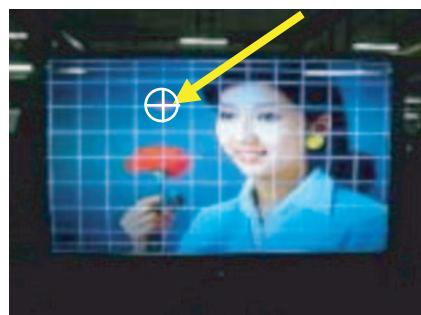


Fig. 3



Fig. 4



Fig. 5

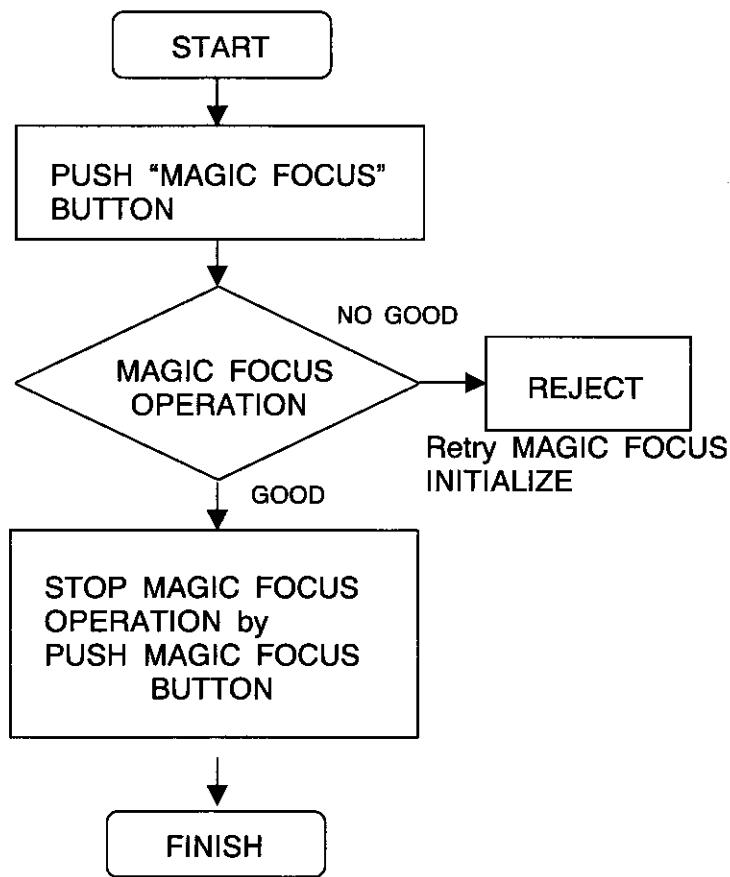
MAGIC FOCUS OPERATION CHECK

Adjustment preparation

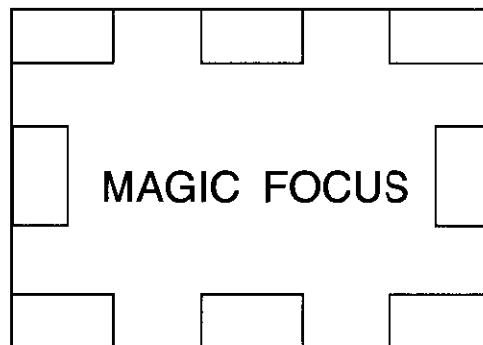
- (1) MAGIC FOCUS INITIALIZE OPERATION should be completed.
- (2) Receive any NTSC signal.

Adjustment procedure

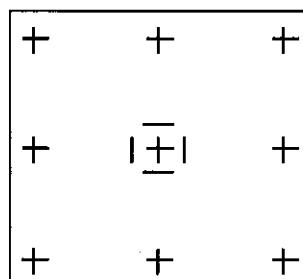
- (1) OPERATION CHECK



MAGIC FOCUS OPERATION
*GOOD (Several windows)



* NO GOOD (9 cross)



DP4X

Note:

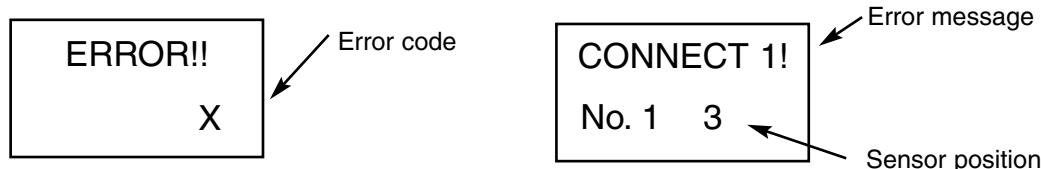
If there is an error, error code (red) appears for about 1 second in bottom right corner.

Refer to CONVERGENCE ERRORS.

Convergence Errors.

If an error message or code appears while performing MAGIC FOCUS or initialize (ASPECT, key in DCU service mode) follow this confirmation and repair method.

1. Turn on power and receive any signal.
2. Press service switch on DEF./CONV. board.
3. Set R/C to DCAM mode (refer to page 47).
4. Press "DAY/NIGHT" then key on remote control.
5. Error code will be displayed in bottom right corner of screen. If there is no error, an "INITIAL OK" message will appear on screen.



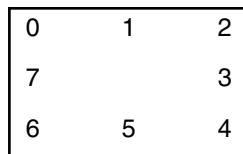
6. Follow repair table for errors.

DCU REPAIR TABLE

Error Code	Error Display Code	Countermeasure	Application	
			Initialize	Magic Focus
1	VF Error	Replace DCU	X	X
2 *2	Connect 1	1. Darken Outside Light 2. Placing of sensor 3. Is pattern hitting sensor 4. Check connection and solder bridge of sensor 5. Replace sensor 6. Replace sensor P.W.B. 7. Sensor Connector check 8. Replace DCU 9. Adjustment check (H/V size, centering)	X	—
3*2	A/D Level	Same as Error Code 2	X	X
4	Over Flow	1. Check the placement of sensor 2. Adjustment check (H/V size, centering) 3. Conv. amp. gain check *1 (check resistor values only)	X	X
5	Convergence	Same as Error Code 4	X	X
7	Operation	Same as Error Code 4	—	X
9	Connect 2	Same as Error Code 2	X	X
10	Noise	Input strong field signal Check the wiring of connector between sensor and DCU	X	X
11	Sync	Input strong field signal Check the wiring of connector between sensor and DCU	X	X

*1 -- RK 53, 54, 57, 58, 61, 62, 65, 66, 69, 70, 73 and 74 check these resistors.

*2 Sensor Position

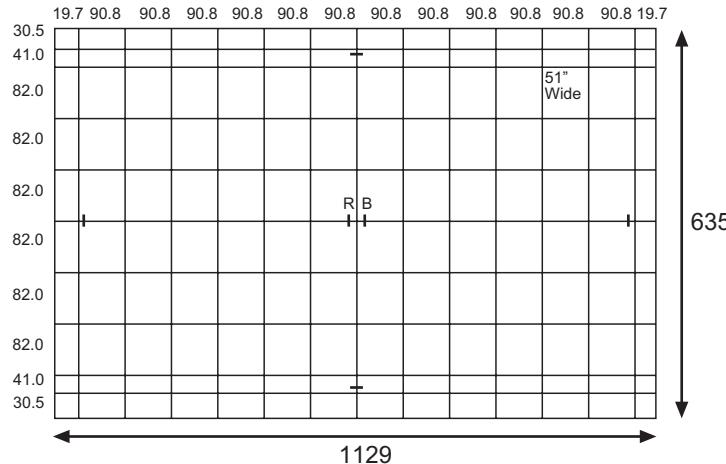


(View from front side)

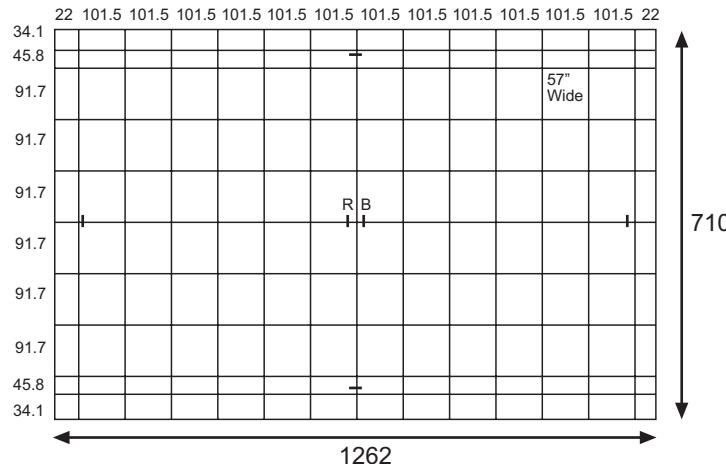
8 Sensors

2.11.3 Convergence Jig Screen Specifications

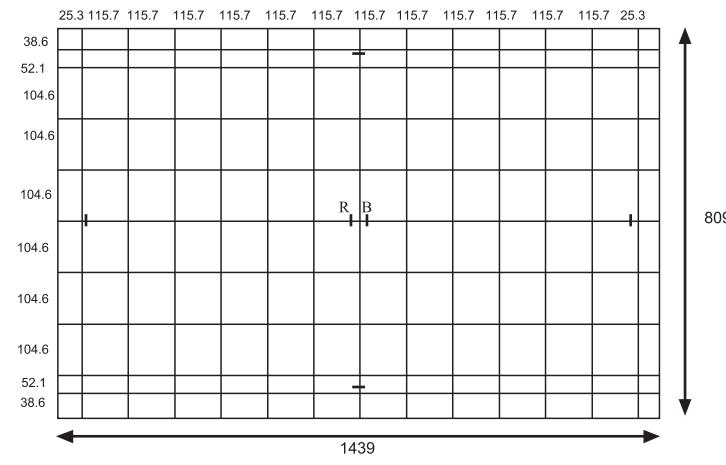
51S715 (Part Number H312272)



57S715 (Part Number H312273)



65F710



Note: If only minor adjustments to convergence are needed, the jig screen is not necessary. Use digital data stored in memory and one color as a reference (red, green, or blue). DO NOT CLEAR DATA and WRITE to ROM memory.

2.11.4 Raster position adjustment (minor)

Adjustment preparation

- (1) Position adjustment - This will move an entire color. Use this adjustment to match colors at the center of the screen. (Active video center from external signal and physical screen center should now match from phase adjustment).

- (2) Use the buttons below to switch color to adjust.
"INFO" - Green
"0" - Red
"INPUTS" - Blue

Adjustment procedure

- (1) Press the button. Extra horizontal lines appear to confirm raster position mode.
- (2) Use the thumb stick to adjust position.
- (3) Press again to exit raster position mode.

Notes: (1) Other functions cannot be accessed when in raster position adjustment mode. Press and confirm extra horizontal lines disappear to exit raster position mode.
(2) Press MENU to remove all colors displayed.

2.11.5 Convergence point adjustment

Adjustment preparation

- (1) Select color to adjust.
"INFO" - Green
"0" - Red
"INPUTS" - Blue
- (2) Use 4, 6, 2, and 5 to move the cursor position (dotted lines).
- (3) Use thumb stick to move the convergence point.
- (4) Three adjustment modes are available:
 1. (3x3) Press "INFO" 5 times (only works when DCU is in uncorrected state)
 2. (7x5) Press "0" 5 times
 3. (13x9) Press "INPUTS" 5 times

For touch-up, only the (13x9) mode is necessary. This will adjust every cross-hatch intersection point on the screen.

For complete adjustment, start with (3x3) mode. This will adjust center point and eight edge points only, but will greatly reduce adjustment time. Then use (7x5) mode, and finally (13x9) mode to finish convergence.

If "S" distortion appears between cross-hatch lines repeat (7x5) mode to change calculation process while adjusting to remove distortion, then return to (13x9) mode to finish touch-up convergence.

Adjustment procedure

- (1) Receive any NTSC signal.
- (2) Start adjustment at the center of the screen.
- (3) Continue adjustment at next closest position.
- (4) Adjust center area first, ending with edge sections.
- (5) Press GUIDE button to perform calculation operation. This process will take about 1 second and no picture will be seen at this time.
- (6) After interpolation, check convergence again and repeat (1)-(5) if necessary.
- (7) When convergence is acceptable, press ASPECT to write data to ROM memory. ROM WRITE? is displayed to alarm system that ROM will be overwritten with new data. Press the ASPECT button again to write displayed data to ROM.
- (8) DATA WRITE TO ROM will take approximately 4 seconds and no picture will be displayed.
- (9) Green dots will be displayed when operation is completed.
- (10) Push VOLUME down to MUTE to return to convergence pattern, then confirm again convergence is acceptable.
- (11) Press ASPECT (ROM WRITE) mode, then press to initialize sensor data positions.

Notes: (1) Display only green for easier adjustment and match to jig screen. Press "MENU", THEN PRESS "INFO".

- (2) Perform interpolation and data write to ROM after green adjustment. Once green has been confirmed to match jig screen, the jig screen can be removed. Do not readjust the green color after jig screen has been removed. This is now your reference color.
- (3) Display green and red only and match red to green.
- (4) Display all colors and match blue to green and red. Touch-up red color if necessary.
- (5) Existing DATA in ROM can be read by pressing the DAY/NIGHT button 2 times. This data can be used after replacing a component (CRT, DY, etc.) Where complete convergence adjustment is not necessary, be careful not to overwrite this data. DO NOT write cleared RAM data into ROM or a complete convergence adjustment will be necessary. Remember to try MAGIC FOCUS before starting convergence adjustment to minimize adjustment time.
- (6) To confirm and fine tune the convergence at the edge of the screen, press the button on the remote control while in the digital convergence adjustment mode (DCAM) for additional lines at the edge of the screen. Fine tune the edge convergence as necessary. To exit, press again.

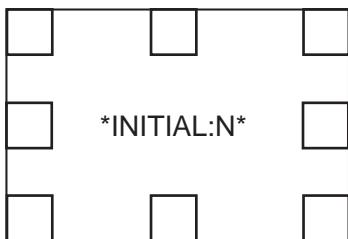
2.11.6 Magic Focus Initialize

Adjustment Preparation

- (1) Receive any NTSC signal.
- (2) Digital convergence adjustment should have been completed.
- (3) Set is in DCU adjustment mode.
- (4) Set R/C in DCAM mode.

Adjustment Procedure

- (1) Press "ASPECT" and then ■ to initialize Magic Focus. The initialize operation starts and several windows appear during this operation. It takes about 30 seconds or less.
- (2) When green dots appear, initialize operation is finished.
- (3) Turn power OFF on TV set.



Initialization Operation

REMARKS

Another way to start the initialize operation:

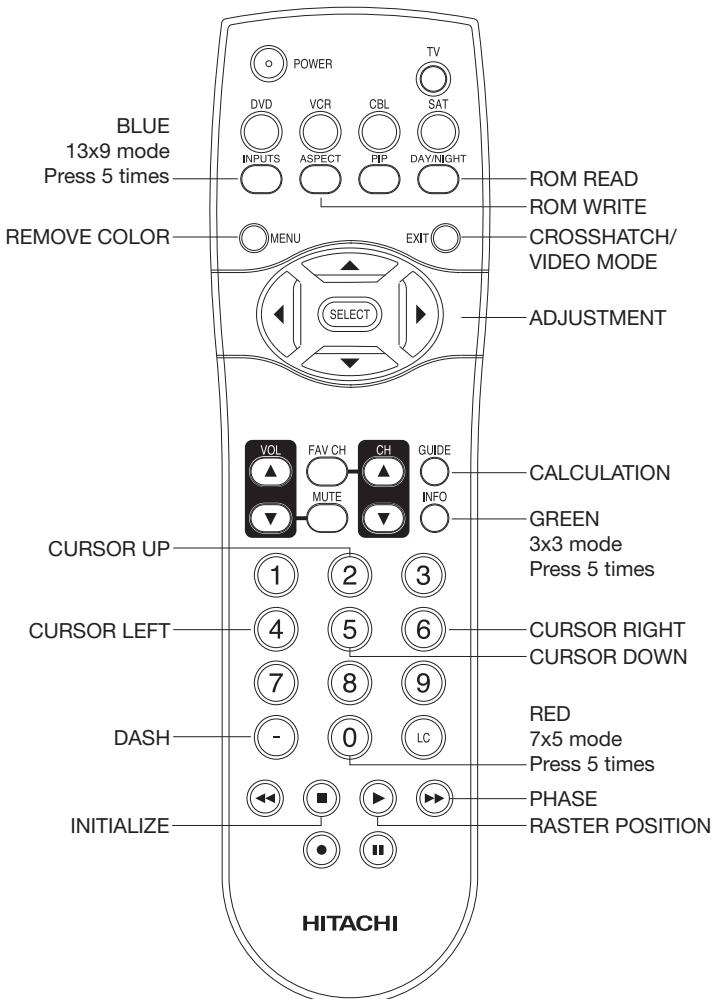
- (1) Press "SERVICE ONLY" Sw. on DEF./CONV. PWB to set DCU adj. mode.
- (2) Press [ASPECT] key on R/C. Then "ROM WRITE?" is displayed for alarm. Next, press ■ key on R/C to start initialization. When green dots appear, initialization operation is finished.

NOTE: If there is an error message, red dots or an error code, refer to page 44, CONVERGENCE ERRORS.

HITACHI DCU ADJUST SPECIAL MODE

- (1) HITACHI DCU Adjust Mode is intended for service use only. Customers should not be given access to this mode.
- (2) To place the remote control into DCU Adjust Mode:
 - a. Press and hold the "TV" button.
 - b. Press and hold the "MENU" button.
 - c. Press and hold the "INFO" button.
 - d. Press and hold the "-" button.
 - e. Release all buttons.
- (3) See image of remote for button operations associated with this mode.
- (4) To exit the DCU Adjust Mode, the user must program the R/C of TV mode to the Hitachi device (pre-code #1345). Hold down the ENT key, then enter 1, 3, 4, 5 to set R/C to normal TV mode.

Digital Convergence Remote Control



NOTE: If the R/C is left in DCAM, the many TV controls will not work. To check, see if the mode selection can be made. It can not be move out of TV mode, then R/C needs to return to TV mode. Press and hold ENT key and enter 1, 3, 4, 5.

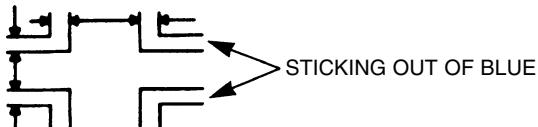
2.12 Blue Defocus adjustment

Adjustment Preparation

- (1) Optical and electrical focus adjustment should have been completed.
- (2) The convergence adjustment should have been completed.
- (3) Set Video conditions to factory preset.
- (4) Input the cross-hatch signal.

Adjustment procedure

- (1) Turn the B Focus VR (Focus Pack) fully clockwise.
- (2) Adjust sticking out level of blue to specification shown in table below, by turning the (B) FOCUS VR counter clockwise.



UNEVENNESS SPECIFICATION: $\pm 1\text{cd}/\text{m}^2$

Defocus sticking out specification

Screen Size	Blue sticking out
51", 57", 65"	1.0mm

Condition: User controls are set to the initial set positions (for shipment)

Measuring point-Screen center.

2.13 White balance adjustment

- (1) Screen adjustment
- (2) High light white balance.
- (3) Low light white balance.

I²C data for High light white balance

Green : G DRIVE (HIGH) 3F (initial data)(Adjustable)
Red : R DRIVE (HIGH) 3F (initial data)(Adjustable)

I²C data for Low light white balance

Green : G CUT OFF (HIGH) 7F (initial) (Fixed data)
Red : R CUT OFF (HIGH) 7F (initial) (Adj. data)
Blue : B CUT OFF (HIGH) 7F (initial) (Adj. data)

Adjustment Preparation

- (1) Adjustment should start 20 min. or more after the TV power is turned ON.
- (2) CUT OFF ADJ. should be finished.
- (3) VIDEO control : Contrast is MAX., Others are center.
- (4) Color temp. : HIGH
- (5) Signal:
 - * High Light white Balance Adj.
White raster 0.715Vpp (w/o sync., termination incidence : 75ohm.) 100IRE
 - * Low Light white balance ADJ.
White raster 0.180Vpp (w/o sync., termination incidence : 75ohm.) 25 IRE (The brightness equal to 20cd/m² at screen center.)

- (6) BLUE defocus ADJ. should be finished.
- (7) The vertical incident illumination on the screen should be 20 Lux. or less.
- (8) Picture Format is 16:9 Standard Mode.
- (9) Go into I²C service mode.

Table 1: White Balance Adjustment Signal

Screen Size	51", 57" and 65"	
High light	[IRE]	100
	[Vpp]	0.715
Low light	[IRE]	25.0
	[Vpp]	0.175

Table 1 shows amplitude of White raster (without sync, termination impedance: 75ohm).

Table 2: White Balance Adjustment Specification

Size	Highlight	Lowlight
51"	10800K $\pm 0\text{MPCD}$	10800K $\pm 0\text{MPCD}$
57"	(x=0.277 ± 0.004 , y=0.284 ± 0.004)	(x=0.277 ± 0.004 , y=0.284 ± 0.004)
65"		

Adjustment Procedure

A. High Light W/B adjustment

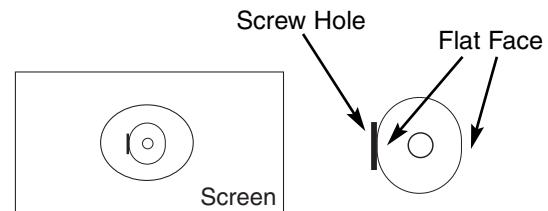
- (1) Receive signal for High Light white balance ADJ.
- (2) Adjust white balance at center of screen, using R DRV/ G DRV within I²C adjust mode (see Table 2).

B. Low Light W/B adjustment

- (1) Receive signal for Low Light white balance ADJ.
- (2) Adjust white balance to center of screen, using R CUT OFF/G CUT OFF/B CUT OFF within I²C adjust mode. Do not touch screen VRs (see Table 2).
- (3) Take Green color as a reference color, then adjust Low Light W/B by increasing other two colors CUT OFF data. Do not change GREEN CUT OFF data. CA-100 Probe should be set to a direction as shown below.

Repeat A & B two or three times, until no adjustment is needed (white balance tracking-GOOD). If W/B tracking is not good, set all data (Both DRV and CUT OFF) to initial data, and change reference color to different color.

Note: If Low Light adj. spec cannot be followed, apply previous adj. spec. (adjust by eye.)



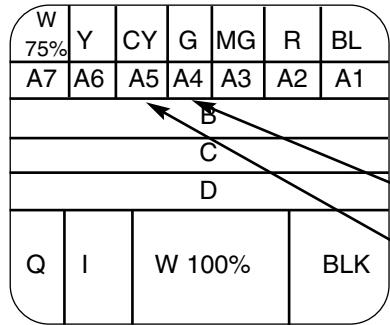
Set probe to above direction.
(Screw hole side should be on the left side)

Top view of
CA-100 Probe

2.14 Sub brightness adjustment

Adjustment preparation

- (1) Start adjustment after the power is turned ON for 20 minutes or more.
- (2) Receive the color bar signal.
- (3) The vertical incident illumination on the screen should be 20 lux or less. (Room should be dark).
- (4) Picture Formats is 16:9 Standard Mode.

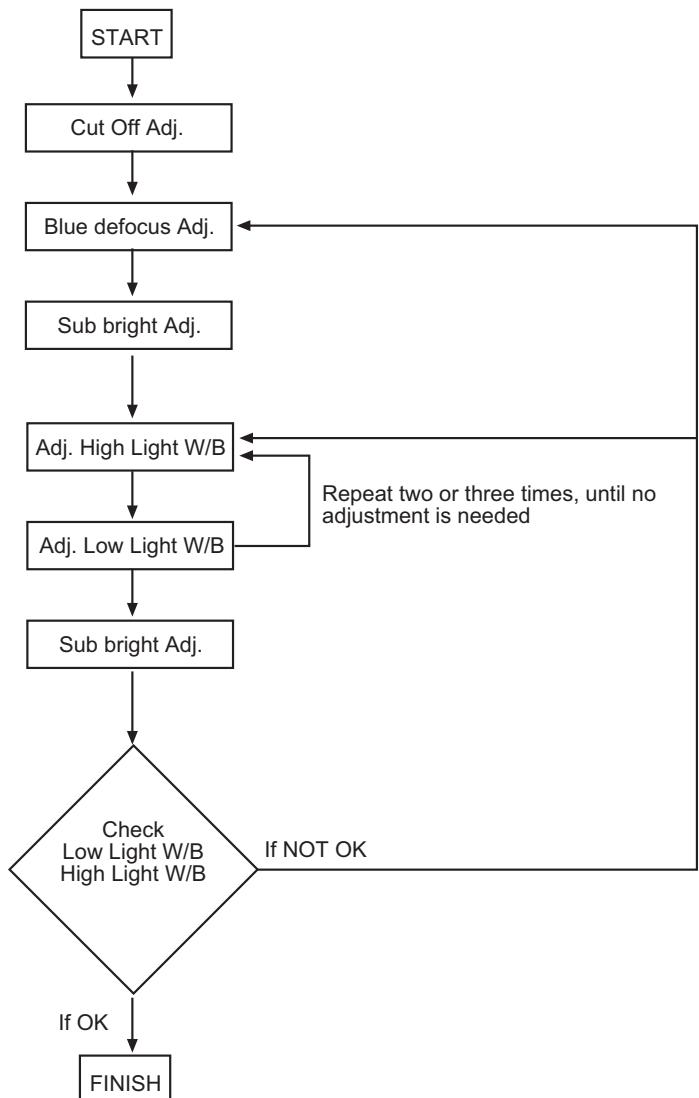


Adjustment procedure

- (1) Go to "Sub Brightness" adjustment in I²C ADJUST mode (press Input and Power button on Control panel at same time), using CURSOR ▲, ▼ and then CURSOR ►.
- (2) Then adjust "Sub Brightness" using CURSOR ◀, ► to increase or decrease the value, according to figure. (Visually adjust).
- (3) After adjustment, press MENU button to exit I²C ADJUST mode. (Data is stored in memory).

Note: When selecting SUB-BRIGHTNESS mode the microprocessor sets the CONTRAST and COLOR to MIN. automatically, but make sure that the other conditions are center.
Directly observe the screen by eye without using a mirror.

WHITE BALANCE ADJUSTMENT FLOW CHART



2.15 Sub Picture Signal Amplitude Adjustment

Adjustment preparation

- (1) Sub-brightness adjustment should be finished.
- (2) Start adjustment about 20 minutes after the power switch is turned on.
- (3) Condition should be as follows:
Contrast : Max
Brightness : Center
- (4) Press PIP button on R/C unit. Select Split mode.
- (5) Receive ANT A NTSC white signal (amplitude 1.0Vp-p), main-picture and sub-picture. (Do not use Video/S-Video/YPBPR/DVI.)
- (6) Connect probe on the P852(CPT P.W.B.-Green) to check sub-picture amplitude.

Adjustment procedure

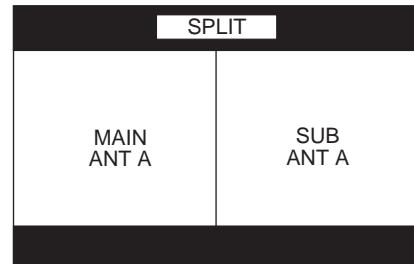
- (1) Go to "SUB CONT(TV-S)" adj. on the I²C service mode.
- (2) Press "PIP" button and "PIP Mode" button of R/C.
- (3) Observe P852 on the CPT P.W.B. and change the "SUB CONT(TV-S)" I²C data so that the amplitude of the sub-picture is the same level as that of the main picture.

DISPLAY

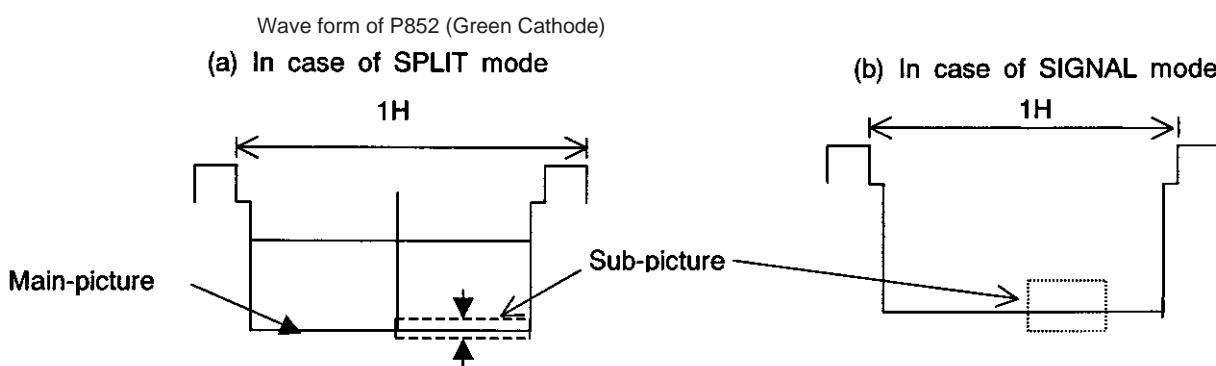
ADJUST MODE	
SUB CNT	**
V SIZE	**
H SIZE	**
EW PARA	**
EW TRAP	**
OSD	<input type="checkbox"/>
AFC	<input type="checkbox"/>
MEMORY INIT	<input type="checkbox"/>
I2COPEN	<input type="checkbox"/>
P MODE ADJ	<input type="checkbox"/>
E2PROM edit	<input type="checkbox"/>

Main Picture

Press "PIP" button
and "PIP Mode"
button



Main Picture



Adjustment specification : $\pm 1V$
Quality control specification : $\pm 3V$

(Sub-picture level compared
with main-picture level.)
(Oscilloscope range:10V/5usec)

2.16 Horizontal position adjustment

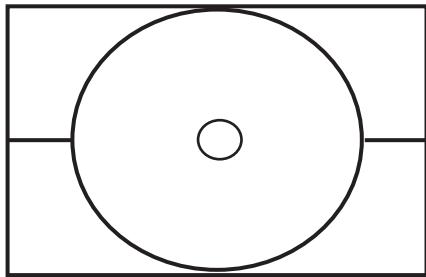
Adjustment preparation

- (1) The screen face of set should be turned to East or West.
- (2) VIDEO control should be set to Factory Preset Condition.
- (3) DIGITAL CONVERGENCE adjustment should be finished.

Adjustment procedure

NORMAL 16:9 STANDARD MODE

- (1) Receive circle pattern.
- (2) Picture Format is 16:9 Standard.
- (3) Go to I²C Adj. mode by pressing INPUT and POWER button on control panel at the same time.
- (4) Choose H. POSITION item using R/C THUMBSTICK ▲,▼.
- (5) Adjust HORIZONTAL POSITION as follows, using R/C THUMBSTICK ◀,▶.

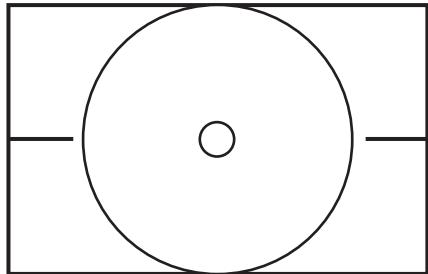


Spec: Balance Left/Right side display position.
H. size marker 1.0~2.0.

Adjustment procedure

1080i 16:9 Standard Mode

- (1) Input 1080i (fH=33.75KHz) component circle pattern signal to component video terminal.
- (2) Picture Format is 16:9 Standard.
- (3) Go to I²C Adj. mode.
- (4) Choose H. POSITION item using R/C THUMBSTICK ▲,▼.
- (5) Adjust HORIZONTAL POSITION as follows, using R/C THUMBSTICK ◀,▶.



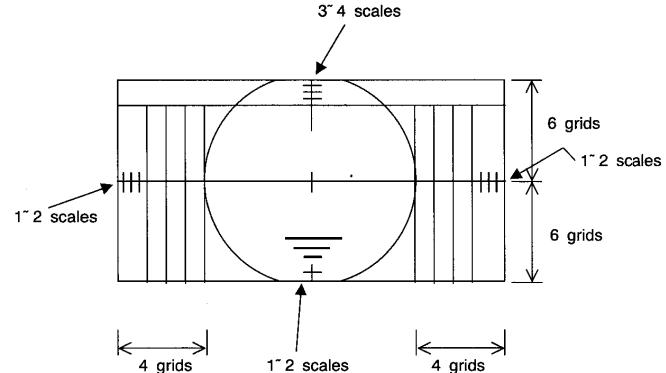
Spec: Balance Left/Right side display position.

2.17 Scanning area check

Checking condition

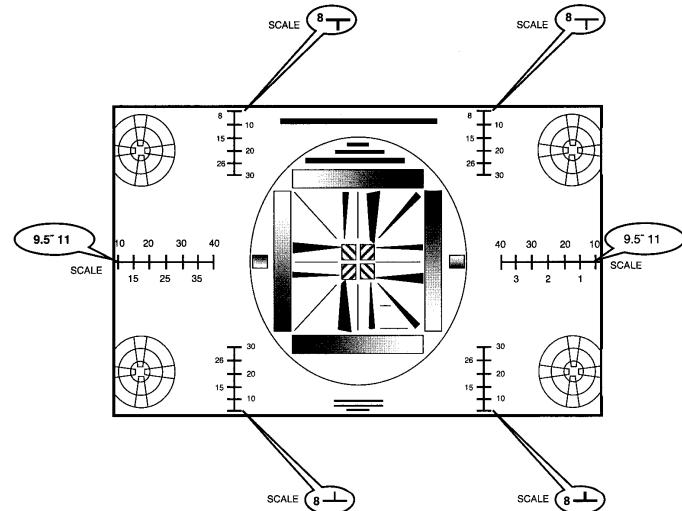
- (1) Digital convergence adjustment should have been completed.
- (2) Receive the circle pattern signal.
- (3) Brightness/Contrast - standard condition
Contrast:max
Other controls:center position
- (4) Check that the scanning area matches with the following drawing.

Receive 1080i circle pattern No. 59 of LT1611*, LT1608* of LEADER signal generator.



- LT1611 : Programmable Video Generator
- LT1608 : Video Encoder

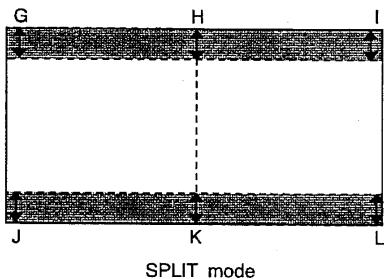
Receive 1080i circle pattern of LT-449 (Leader)



2.18 TOP & BOTTOM PANEL DISTORTION CHECK

Measuring Condition

- (1) Measure it after 20 minutes or later of the picture appearance.
- (2) Display NTSC.
Contrast: Max, Brightness: Center
- (3) Press [PIP] key on remote controller to select "SPLIT" mode as shown below.
- (4) Measure Top & Bottom panel width as shown.



Specification : Top & Bottom distortion ... Value shown in the following table or less.
(Unit : mm)

Pincushion distortion	46"	51"	57"	65"	Remarks
G - H H - I	±1.5	±2.0	±2.0	±2.5	
J - K K - L	±1.5	±2.0	±2.0	±2.5	

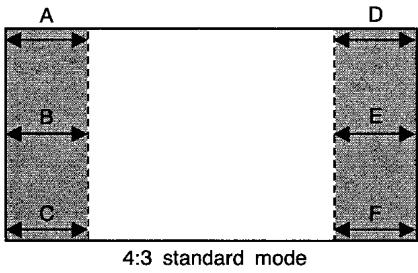
Trapezoidal distortion	46"	51"	57"	65"	Remarks
G - I	±1.0	±2.0	±1.5	±2.0	
J - L	±1.0	±2.0	±1.5	±2.0	

2.19 -SIDE PANEL DISTORTION AND TOP & BOTTOM PANEL DISTORTION CHECK

SIDE PANEL DISTORTION CHECK

Measuring Condition

- (1) Measure it after 20 minutes or later of the picture appearance.
- (2) Display NTSC Hitachi circle pattern signal, set Aspect to 4:3 standard mode.
Contrast: Max, Brightness: Center
- (3) Measure side panel width as shown below A ~ F.



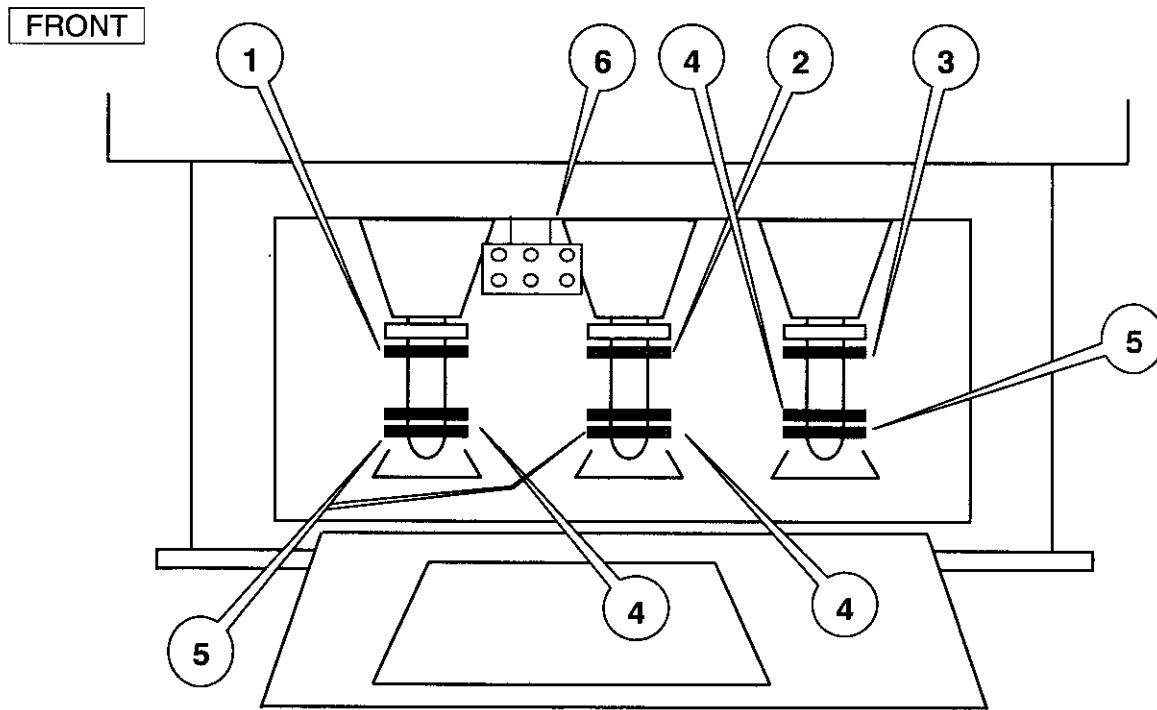
Specification : Side panel distortion ... Value shown in the following table or less.
(Unit : mm)

Pincushion distortion	46"	51"	57"	65"	Remarks
A - B B - C	±2.0	±2.5	±2.5	±3.0	
D - E E - F	±2.0	±2.5	±2.5	±3.0	

Trapezoidal distortion	46"	51"	57"	65"	Remarks
A - C	±1.5	±2.0	±2.0	±2.5	
D - F	±1.5	±2.0	±2.0	±2.5	

NOTE: If any of the above is not within specification, re-adjust side pin distortion and trapezoid distortion page 36-37 and adjust convergence.

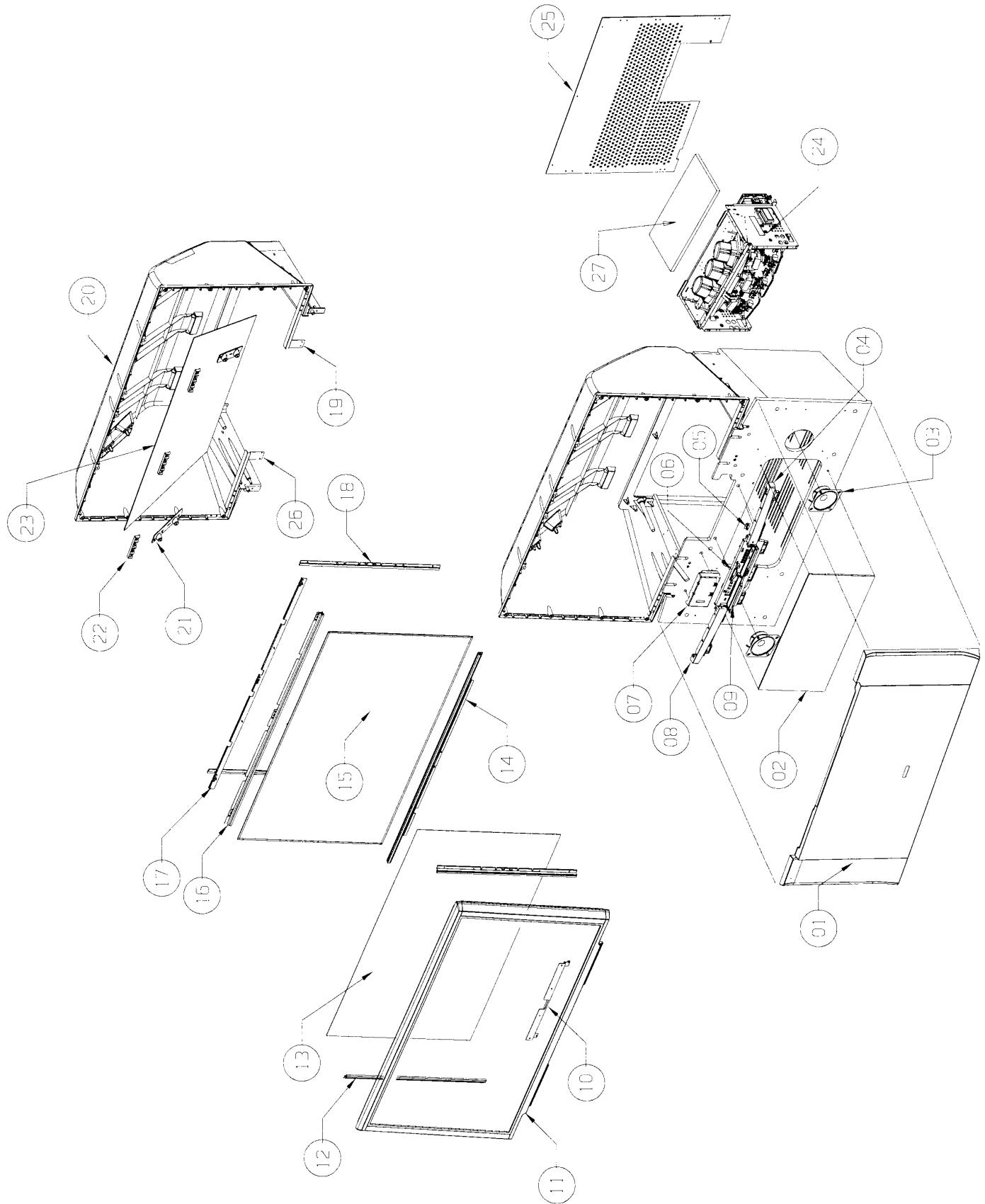
**2.19.1. ADJUSTMENT POINT
CRT, cabinet locations**



1. CENTERING MAGNET FOR RED PRT
2. CENTERING MAGNET FOR GREEN PRT
3. CENTERING MAGNET FOR BLUE PRT
4. 4-POLE MAGNET FOR BEAM FORM ADJUSTMENT
5. BEAM ALIGNMENT MAGNET
6. FOCUS PACK

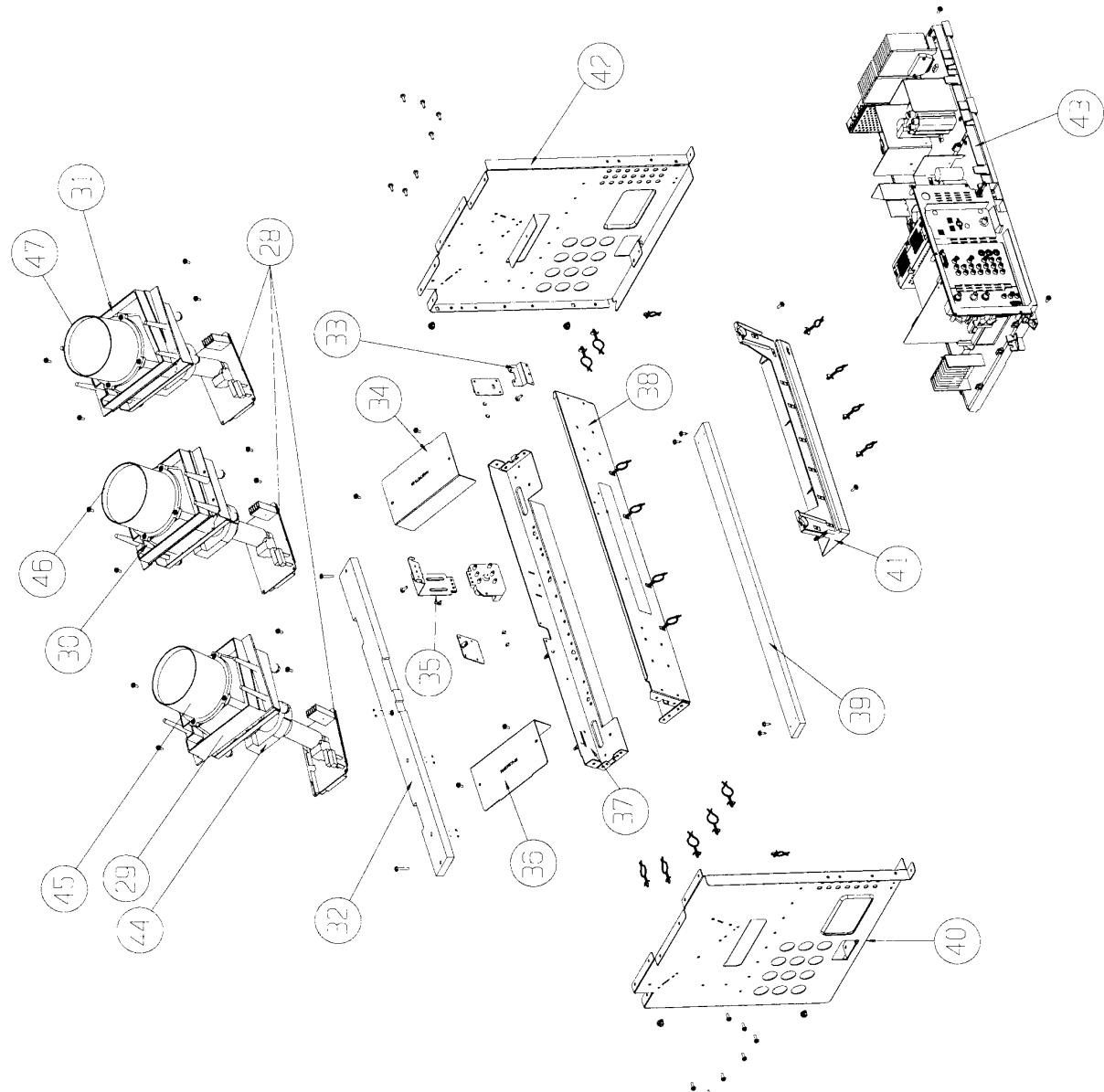
EXPLODED VIEW

51F710 / 57F710



EXPLODED VIEW

51F710 / 57F710



Model 51F710

No	Part No	Description	Qty.
1	PH34101	SPEAKER GRILLE ASSY 51F510	1
2	31020278	FRONT COVER 51/57F	1
3	GK01301	SP-12CM C120RB514-10	2
4	PH34123	DECO PANEL 51" (R) F	1
5	PH34232	IR LENS F/G	1
6	PH34186	CONTROL PANEL F	1
7	NJ09841	PWB COVER	1
8	PH34125	DECO PANEL 51" (L) F	1
9	PH34192	CONTROL DOOR_F	1
10	NA72183	METAL SCREEN SUPPORT F	1
CH 3	p. 38	SCREEN FRAME 51"	1
11	PH34051	SCREEN HOLDER 51" (SIDE)	2
12	KR03251	ULTRASHIELD HC 51W	1
13	PH35321	51" BOTTOM SCREEN HOLDER (REV)	1
14	KR03302	DP4X SCREEN ASSY 51W DN	1
15	PH34031	SCREEN HOLDER 51" (TOP)	1
16	NA72451	51" TOP SCREEN BRACKET	1
17	NJ20181	51" SIDE SCREEN HOLDER B	2
18	NA73894	51" L-BRACKET (RIGHT)	1
19	QD38061	BACK COVER 51"	1
20	NJ09156	SIDE MIRROR HOLDER L	1
21A	NJ09155	SIDE MIRROR HOLDER R	1
22	NJ09161	TOP MIRROR HOLDER	3
23	KS07995	'04 51" MODELS MIRROR GLASS	1
24	UE23351	51F710 CORE BLOCK ASSY	1
25	H512334	LOWER REAR B. DP4X	1
26	NA73893	51" L-BRACKET (LEFT)	1
27	33020117	BARRIER BOARD ASSY F	1
28	JT24502	DP45 CPT CONTROL PWB ASSY	1
29	UE23421	HSB-MAB 51 LENS CRT B. ASSY [R]	1
30	UE23422	HSB-MAB 51 LENS CRT B. ASSY [G]	1
31	UE23423	HSB-MAB 51 LENS CRT B. ASSY [B]	1
32	NM00941	CHASSIS SUPPORT 2002	1
33	NA57181	IR PWB FIX MTL DP2X	1

34	NA57578	LC METAL 2002-57 SIDE	1
35	NA61121	FOCUS BOX FIX METAL 43(4:3) SECC20/20Et=1.2	1
36	NA57578	LC METAL 2002-57 SIDE	1
37	NA71022	LC METAL 2004-20-6 FRONT	1
38	NA71031	LC METAL 2004-20.6 REAR	1
39	NM00941	CHASSIS SUPPORT 2002	1
40	NA71041	SIDE METAL 2004-20.6 RIGHT	1
41	NJ06582	DRIPPING HOLDER DP4X	1
42	NA71042	SIDE METAL 2004-20.6 LEFT	1
43	UE23122	DP45 CHASSIS ASY	1
44	see page 35	DEFLECTION YOKE	3
45	KQ03081K	HSB LENS SASS RG	1
46	KQ03081K	HSB LENS SASS RG	1
47	KQ03082K	HSB LENS SASS B	1

NOTE : In part number showed on item 28, is included the following PWB assy, (control PWB, IR PWB and PRT PWB (R, G & B)).

CH 2

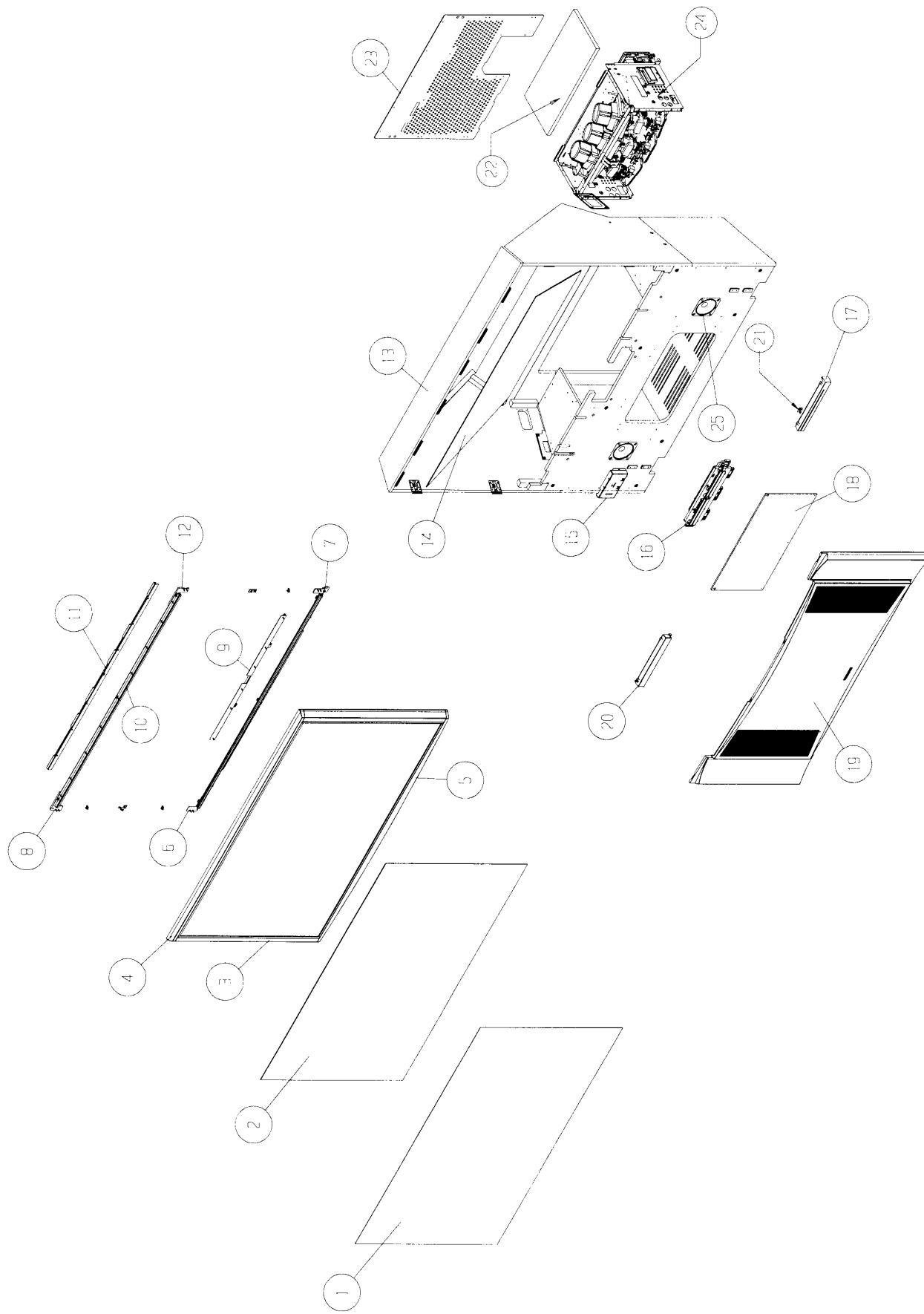
Model 57F710

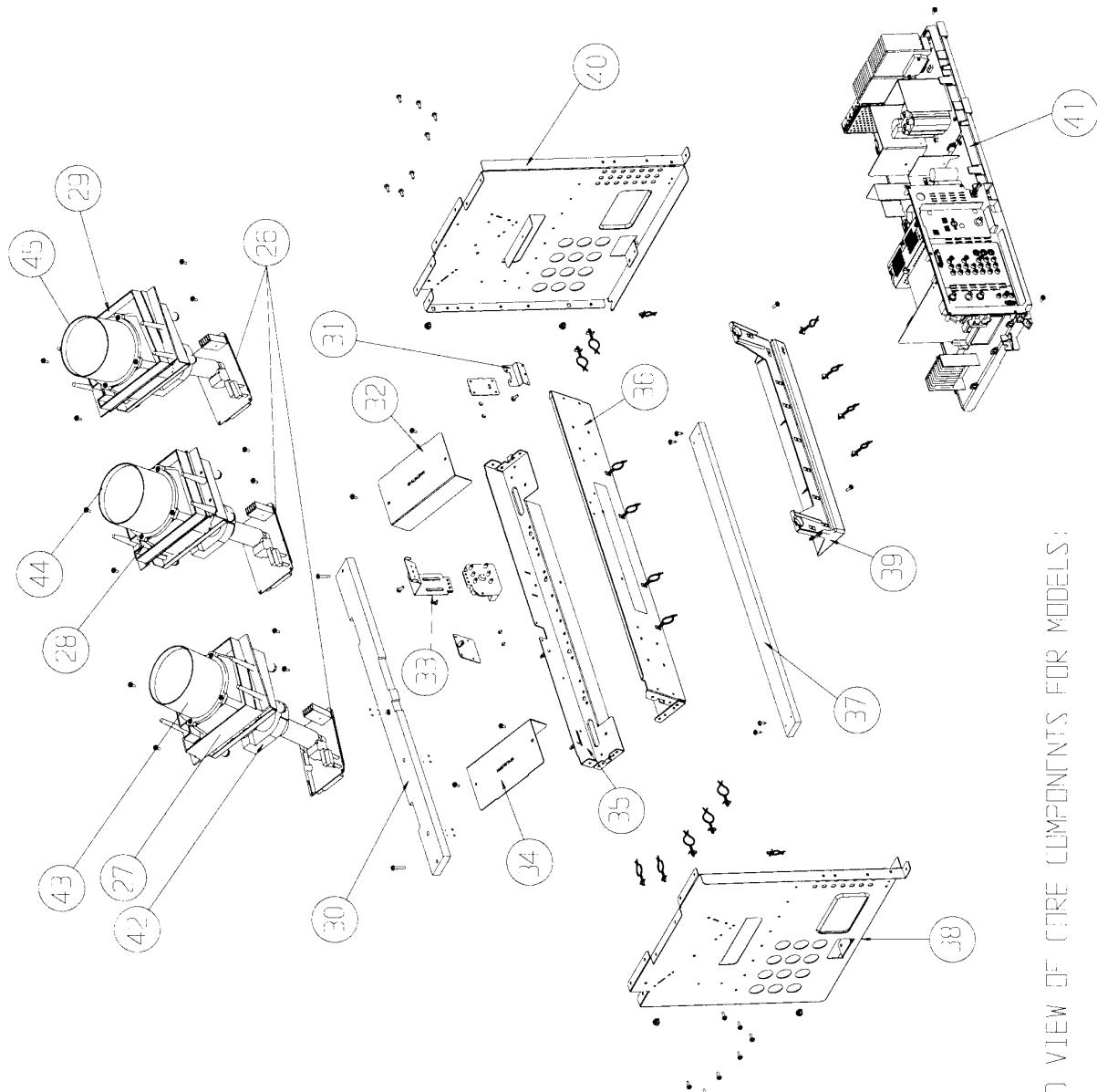
No	Part No	Description	Qty.
1	PH33952	SPEAKER GRILLE 57F510	1
2	55010267	FRONT BOARD 2002	1
3	GK01311	SP-16CM C160RB506-10	2
4	PH34073	DECO PANEL 57" (R) F	1
5	PH34232	IR LENS F/G	1
6	PH34186	CONTROL PANEL F	1
7	NJ09841	PWB COVER	1
8	PH34075	DECO PANEL 57" (L) F	1
9	PH34192	CONTROL DOOR_F	1
10	NA72183	METAL SCREEN SUPPORT F	1
CH 3	p. 39	SCREEN FRAME 57"	1
11	PH34052	SCREEN HOLDER 57" (SIDE)	2
12	KR03255	ULTRASHIELD HC 57W	1
13	PH35322	57" BOTTOM SCREEN HOLDER (REV)	1
14	KR03306	DP4X SCREEN ASSY 57W DN	1
15	PH34032	SCREEN HOLDER 57" (TOP)	1
16	NA72452	57" TOP SCREEN BRACKET	1
17	NJ20182	57" SIDE SCREEN HOLDER B	2
18	NA73902	57" L-BRACKET (RIGHT)	1
19	QD38051	BACK COVER 57"	1
20	NJ09156	SIDE MIRROR HOLDER L	1
21A	NJ09155	SIDE MIRROR HOLDER R	1
22	NJ09161	TOP MIRROR HOLDER	5
23	KS07993	'04 57" MODELS MIRROR GLASS	1
24	UE23352	57F710 CORE BLOCK ASSY	1
25	H512334	LOWER REAR B. DP4X	1
26	NA73893	51" L-BRACKET (LEFT)	1
27	33020117	BARRIER BOARD ASSY F	1
28	JT24502	DP45CPT CONTROL PWB ASSY	1
29	UE23424	HSB-MAB 57 LENS CRT B. ASSY [R]	1
30	UE23425	HSB-MAB 57 LENS CRT B. ASSY [G]	1
31	UE23426	HSB-MAB 57 LENS CRT B. ASSY [B]	1
32	NM00941	CHASSIS SUPPORT 2002	1
33	NA57181	IR PWB FIX MTL DP2X	1

34	NA57578	LC METAL 2002-57 SIDE	1
35	NA61121	FOCUS BOX FIX METAL 43(4:3) SECC20/20Et=1.2	1
36	NA57578	LC METAL 2002-57 SIDE	1
37	NA71022	LC METAL 2004-20-6 FRONT	1
38	NA71031	LC METAL 2004-20.6 REAR	1
39	NM00941	CHASSIS SUPPORT 2002	1
40	NA71041	SIDE METAL 2004-20.6 RIGHT	1
41	NJ06582	DРИPPING HOLDER DP4X	1
42	NA71042	SIDE METAL 2004-20.6 LEFT	1
43	UE23122	DP45 CHASSIS ASY	1
44	see page 35	DEFLECTION YOKE	3
45	KQ03081K	HSB LENS SASS RG	1
46	KQ03081K	HSB LENS SASS RG	1
47	KQ03082K	HSB LENS SASS B	1

NOTE : In part number showed on item 28, is included the following PWB assy, (control PWB, IR PWB and PRT PWB (R, G & B)).

CH 2

EXPLODED VIEW**65F710**

EXPLODED VIEW**65F710**

EXPLODED VIEW OF TIRE COMPONENTS FOR MODELS:
65F710

Model 65F710

No	Part No	Description	Qty.
1	KR03263	ULTRASHIELD HC 65W	1
2	KR03307	DP4X SCREEN ASSY 65W	1
CH 3	p. 40	SCREEN FRAME 65" (SIDE)	2
4	QD38103	TOP FRAME PAINTED 65F	1
5	QD38104	BOTTOM FRAME PAINTED 65F	1
6	NA73771	65F BOTTOM CORNER METAL (L)	1
7	NA73772	65F BOTTOM CORNER METAL (R)	1
8	NA73761	65F TOP CORNER METAL (L)	1
9	NA73841	65" BOTTOM SUPPORT	1
10	QD38131	SCREEN HOLDER 65" (TOP)	1
11	NA73781	65F TOP METAL SUPPORT	1
12	NA73762	65F TOP CORNER METAL (R)	1
13	QD39431	65F710 CABINET ASY	1
14	KS07994	MIRROR GLASS 65" 2004	1
15	NJ09841	PWB COVER	1
16	PH34186	CONTROL PANEL F	1
16A	PH34192	CONTROL DOOR_F VERSION	1
17	PH34211	DECO PANEL 65F710 (R)	1
18	55010267	FRONT BOARD 2002	1
19	PH34151	SPEAKER GRILLE ASSY 65F710	1
20	PH34212	DECO PANEL 65F710 (L)	1
21	PH34232	IR LENS F/G	1
22	33020117	BARRIER BOARD ASSY F	1
23	H512334	LOWER REAR B. DP4X	1
24	UE23353	577715 CORE BLOCK ASSY	1
25	GK01311	SP-16CM C160RB506-10	2
26	JT24502	DP45 CPT CONTROL PWB ASSY	1
27	UE24271	D2XX-MAB LENS CRT B. ASSY (R)	1
28	UE24272	D2XX-MAB LENS CRT B. ASSY (G)	1
29	UE24273	D2XX-MAB LENS CRT B. ASSY (B)	1
30	NM00941	CHASSIS SUPPORT 2002	1
31	NA57181	IR PWB FIX MTL DP2X	1
32	NA57578	LC METAL 2002-57 SIDE	1
33	NA61121	FOCUS BOX FIX METAL 43(4:3) SECC20/20Et=1.2	1

34	NA57578	LC METAL 2002-57 SIDE	1
35	NA71022	LC METAL 2004-20-6 FRONT	1
36	NA71031	LC METAL 2004-20.6 REAR	1
37	NM00941	CHASSIS SUPPORT 2002	1
38	NA71041	SIDE METAL 2004-20.6 RIGHT	1
39	NJ06582	DРИPPING HOLDER DP4X	1
40	NA71042	SIDE METAL 2004-20.6 LEFT	1
41	UE23122	DP45 CHASSIS ASY	1
42	see below	DEFLECTION YOKE	1
43	KQ02332	DELTA260 A/B ASSY	1
44	KQ02332	DELTA260 A/B ASSY	1
45	KQ02332	DELTA260 A/B ASSY	1

NOTE : In part number showed on item 26, is included the following PWB assy, (control PWB, IR PWB and PRT PWB (R, G & B)).

DEFLECTION YOKE PART NUMBERS

MODEL	SERIAL	PART NUMBER
51F710	V4H000000 and below	BY01664
51F710	V4H000001 and above	BY01555
57F710	V4H000000 and below	BY01664
57F710	V4H000001 and above	BY01555
65F710	V4H000000 and below	BY01664
65F710	V4H000001 and above	BY01555

CH 2

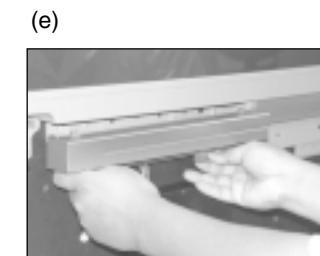
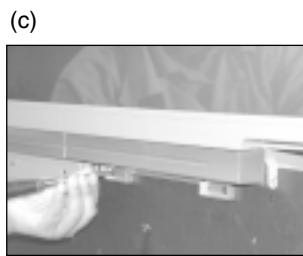
IMPORTANT POINTS:

- (a) Do not attempt to perform this work by yourself.
- (b) Request an installation specialist to install this unit.
- (c) HITACHI assumes no responsibility or liability for injury/damage as a result of consumer installation and handling. Be advised that improper consumer installation/handling is not covered by manufacturer's warranty.
- (d) This Projection Television weighs over 206.3 pounds and has many sensitive components.

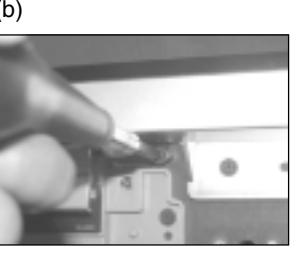
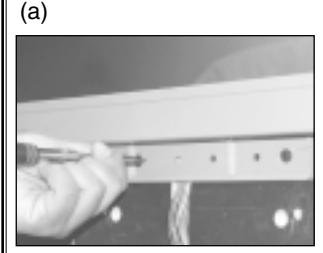
CAUTION: DISCONNECT UNIT FROM POWER SOURCE BEFORE DISASSEMBLY / ASSEMBLY

1 - SEPARATION PROCEDURE (Note: read all instructions and understand how to properly and safely disassemble and assemble unit)

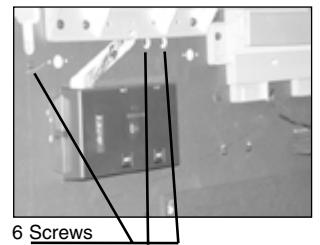
STEP 1 Before disassembling this projection TV set, you must first remove the speaker grille by grabbing the sides and pulling left and right side see (a)(b). Remove the front decoration panels by unscrewing the 2 screws from each panel, see (c), then remove from the original position, see (d)(e).



STEP 2 Remove the 8 screws that hold the screen frame to the cabinet on the front side.



STEP 3 Remove the 6 screws that hold the back cover to the cabinet on the front side.



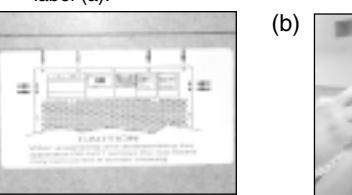
STEP 4 Remove the sensor box by unscrewing the 2 screws located on both sides of the sensor box, see (a). Rotate the sensor box and there are 4 low voltage connectors located on the sensor board, see (b). Disconnect the connector with the brown wires (PDSE), see (c) and (d). (Make sure to push the center lock on the connector at the unplug time.)



STEP 5 Remove the joint connector bolts from each side of the back cover using the allen wrench that is provided inside of the instruction bag, see (a) and (b).



STEP 6 Remove from the back side of the TV set only the top 4 screws of the lower rear cover, see (b), as shown by the arrows on the rear cabinet label, see (a). Do not remove the rear cover board. Remove the (4) four side screws that hold the back cover to the cabinet, see (c) as shown on the label (a).



STEP 7 **Caution:** When the TV is separated, the top portion weights 45 lbs. This task should be done by two persons when separating this TV. This assembly contains fragile parts, such as glass and the viewing screen. Avoid any type of impact that could cause breakage of these components. Remove top portion by grabbing the bottom corner of frame and the back cover, see (a)(b). Lift upwards, see (c)(d), gently place the top portion on the floor, see (e).



THESE INSTRUCTIONS MUST REMAIN ON UNIT

2 - RE-ASSEMBLY PROCEDURE

STEP 8 To re-assemble the set, lift the top portion and align onto the bottom cabinet. Gently lower the top portion until it sits flush on the bottom.



STEP 9 Re-install the joint connector bolts (4 pcs.) that were removed in step 5 of the disassembly.



STEP 10 Re-install the top (4) four screws into the lower rear cover, see (a). Re-install the (4) four side screws that hold the back cover to the cabinet, see (b).



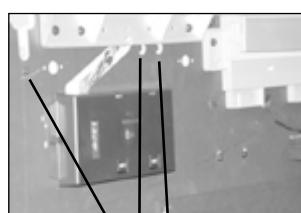
STEP 11 Re-connect the sensor connector to the sensor board, see (a). Re-install the sensor box, see (b).



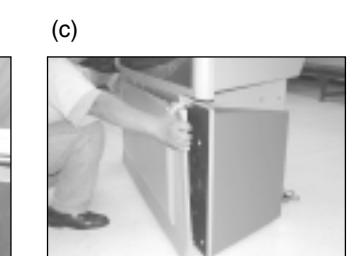
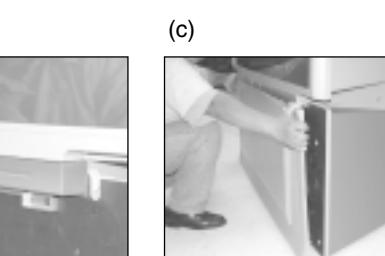
STEP 12 Re-install the 8 screws that hold the frame to the cabinet on the front side of the TV.



STEP 13 Re-install the 6 screws that hold the back cover to the cabinet on the front side of the TV.



STEP 14 Re-install both of the front decoration panels, see (a) and (b).. Re-install the speaker grille, aligning it with the bottom cabinet, see (c). This completes the Disassembly and Assembly instructions.



IMPORTANT POINTS:

- (a) Do not attempt to perform this work by yourself.
- (b) Request an installation specialist to install this unit.
- (c) HITACHI assumes no responsibility or liability for injury/damage as a result of consumer installation and handling. Be advised that improper consumer installation/handling is not covered by manufacturer's warranty.
- (d) This Projection Television weighs over 272.8 pounds and has many sensitive components.

CAUTION: DISCONNECT UNIT FROM POWER SOURCE BEFORE DISASSEMBLY / ASSEMBLY

1 - SEPARATION PROCEDURE (Note: read all instructions and understand how to properly and safely disassemble and assemble unit)

STEP 1 Before disassembling this projection TV set, you must first remove the speaker grille by grabbing the sides and pulling left and right side see (a)(b). Remove the front decoration panels by unscrewing the 2 screws from each panel, see (c), then remove from the original position, see (d)(e).



(c)



(d)



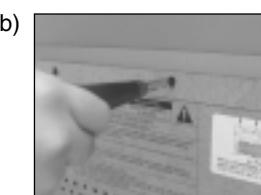
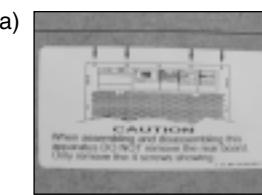
(e)



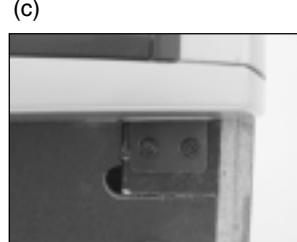
STEP 4 Remove the joint connector bolts from each side of the TV set using the allen wrench that is provided inside of the instruction bag, see (a) and (b).



STEP 5 Remove from the back side of the TV set only the top 4 screws of the lower rear cover, see (b), as shown by the arrows on the rear cabinet label, see (a). Do not remove the rear cover board.



STEP 2 Remove the 8 screws that hold the screen frame to the cabinet on the front side. DO NOT remove the right and left edge screen frame screws (c).



STEP 3 Remove the sensor box by unscrewing the 2 screws located on both sides of the sensor box, see (a). Rotate the sensor box and there are 4 low voltage connectors located on the sensor board, see (b). Disconnect wires (PDSE), see (c) and (d). (Make sure to push the center lock on the connector at the unplug time.)



STEP 6 **Caution:** When the TV is separated, the top portion weighs 112 lbs. This task should be done by two persons to carry top portion when separating this TV.

This assembly contains fragile parts, such as glass and the viewing screen. Avoid any type of impact that could cause breakage of these components.

Remove top portion by grabbing the bottom corner of frame and the side of the TV, see (a)(b). Lift upwards, see (c)(d), gently place the top portion on the floor, see (e).



THESE INSTRUCTIONS MUST REMAIN ON UNIT

2 - RE-ASSEMBLY PROCEDURE

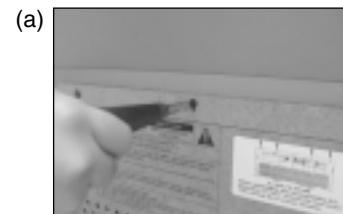
STEP 7 To re-assemble the set, lift the top portion and align onto the bottom cabinet. Gently lower the top portion until it sits flush on the bottom.



STEP 8 Re-install the joint connector bolts (4 pcs.) that were removed in step 4 of the disassembly.



STEP 9 Re-install the top (4) four screws into the lower rear cover, see (a).



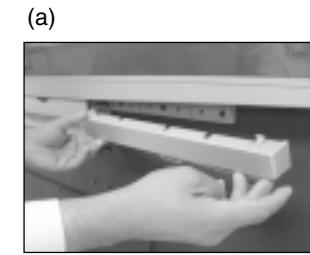
STEP 10 Re-connect the sensor connector to the sensor board, see (a). Re-install the sensor box, see (b).



STEP 11 Re-install the 8 screws that hold the frame to the cabinet on the front side of the TV.



STEP 12 Re-install both of the front decoration panels, see (a) and (b). Re-install the speaker grille, aligning it with the bottom cabinet, see (c). This completes the Disassembly and Assembly instructions.



51F710**51 INCH PTV**

CS00627	FLEX CONTROL (HC5627)
CS00834	DCU (HC2614)
HA01312	POWER UNIT DP4X-DM_24W
HL02071	REMOTE CONTROL UNIT
HP00773	ANTENNA SWITCH BOX YAA41-0171G
JT24472	DP45 SIGNAL PWB
JT24482	DP45 POWER DEFLECTION PWB
JT24492	DP45 HDMI PWB
JT24502	DP45 CPT / CONTROL PWB
JT24512	DP45 CONVERGENCE OUTPUT PWB
JT24522	DP45 TUNER PWB
KR03251	ULTRASHIELD HC 51W
KR03302	DP43 SCREEN ASSY 51
KS07995	'04 51" MODELS MIRROR GLASS
NT04071	FRAME ASSY 51F510
UE23122	DP45 CHASSIS ASSY
UE23142	DP45 SIGNAL BOARD ASSY
UE23152	DP45 POWER DEFLECTION BOARD ASSY
UE23411	DIGITAL MODULE (HCY501)
UE23421	DP43 51 PRT ASSY (R)
UE23422	DP43 51 PRT ASSY (G)
UE23423	DP43 51 PRT ASSY (B)
X480282	SUB DEFLECTION PWB
61010150	CASTER WHEEL

SIGNAL BOARD ASSY includes Signal, Tuner, HDMI, and Digital Module

POWER DEFLECTION BOARD ASSY includes Power Deflection PWB and Convergence Output PWB

57F710**57 INCH PTV**

CS00627	FLEX CONTROL (HC5627)
CS00834	DCU (HC2614)
HA01312	POWER UNIT DP4X-DM_24W
HL02071	REMOTE CONTROL UNIT
HP00773	ANTENNA SWITCH BOX YAA41-0171G
JT24472	DP45 SIGNAL PWB
JT24482	DP45 POWER DEFLECTION PWB
JT24492	DP45 HDMI PWB
JT24502	DP45 CPT / CONTROL PWB
JT24512	DP45 CONVERGENCE OUTPUT PWB
JT24522	DP45 TUNER PWB
KR03255	ULTRASHIELD HC 57W
KR03306	SCREEN ASSY NO SHIELD
KS07993	'04 57" MODELS MIRROR GLASS
NT04081	FRAME ASSY 57F510
UE23122	DP45 CHASSIS ASSY
UE23142	DP45 SIGNAL BOARD ASSY
UE23152	DP45 POWER DEFLECTIONS BOARD ASSY
UE23411	DIGITAL MODULE (HCY501)
UE23424	PRT ASSY (R)
UE23425	PRT ASSY (G)
UE23426	PRT ASSY (B)
X480282	SUB DEFLECTION PWB
61010150	CASTER WHEEL

SIGNAL BOARD ASSY includes Signal, Tuner, HDMI, and Digital Module

POWER DEFLECTION BOARD ASSY includes Power Deflection PWB and Convergence Output PWB

65F710**65 INCH PTV**

CS00627	FLEX CONTROL (HC5627)
CS00834	DCU (HC2614)
HA01313	POWER UNIT DP4X-DM_24W
HL02071	REMOTE CONTROL UNIT
HP00773	ANTENNA SWITCH BOX YAA41-0171G
JT24472	DP45 SIGNAL PWB
JT24482	DP45 POWER DEFLECTION PWB
JT24492	DP45 HDMI PWB
JT24502	DP45 CPT / CONTROL PWB
JT24512	DP45 CONVERGENCE OUTPUT PWB
JT24522	DP45 TUNER PWB
KR03263	ULTRASHIELD HC 65W
KR03307	DP45 SCREEN ASSY 65
KS07994	MIRROR GLASS 65" 2004
NT04661	FRAME ASSY 65F710
UE23122	DP45 CHASSIS ASSY
UE23142	DP45 SIGNAL BOARD ASSY
UE23152	DP45 POWER DEFLECTION BOARD ASSY
UE23411	DIGITAL MODULE (HCY501)
UE24271	DP45 65 PRT ASSY (R)
UE24272	DP45 65 PRT ASSY (G)
UE24273	DP45 65 PRT ASSY (B)
X480282	SUB DEFLECTION PWB
61010151	CASTORS FOR 65"

SIGNAL BOARD ASSY includes Signal, Tuner, HDMI, and Digital Module

POWER DEFLECTION BOARD ASSY includes Power Deflection PWB and Convergence Output PWB

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